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FIFTY-EIGHTH YEAR

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AMERICAN GAS LIGHT JOURNAL

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Paying the War Time Gas Bill in France

Gas Companies Working Under Difficulties—Payments Made to Bank Clerk and Not to Company's Collectors—Some Anomalies of Municipalization

By FRANCIS MILTOUN

Paris has something like a three-million population within the walls, and 700,000 gas subscribers, living in 40,000 separate buildings, who deposit an advance on the gas supposed to be consumed between the rendering of bills of an average of 10 francs each; a working capital contributed by the public of a close approach to a million and a half dollars. It looks like a good business proposition to start with,—it was before the war—but latterly things have taken another complexion.

Bills Paid to Bank Clerk

It may be a wartime measure, or it may not, but you pay your gas bill, not to the company's collector but to a bank clerk, a *garcon de recette,* who, in three-cornered cocked hat, light blue cutaway coat with many gilt buttons, and a big brass badge pinned on his breast, presents himself and the bill, and discusses nothing; simply shoves a blue, red or yellow enigmatic paper to you if you don't pay—then departs.

A little later you hear from the company!

It's not a bad system after all, and, *en principe,* there should be no more discussion over the readings of a gas meter and the computations of the bill rendered (save that the latter in France are usually illegible and have to be guessed at, such a thing as a duplicating typed system of rendering a bill being unknown) at about $1.12 per thousand cubic feet (this figured on the value of the franc and dollar before they changed places as an exchange medium) than there should be with a milk bill. Certainly, in Paris, the milk bottle is of varying size and its contents of varying quality and quantity, and, though the French housewife never thinks of protesting this, she will question every centime on a gas or electricity bill in spite of the fact that the Paris Gas Company is in reality a quasi-municipal affair to begin with, and its books are "controlled"—whatever that may mean—by the city controller.

Municipality a Partner in the Business

The Municipality being a partner in the business, the gas subscriber signs his contract and agrees not to dispute bills on presentation, but to pay them and discuss it afterwards.

The system has its disadvantages for the consumer, and the city being a partner in the business, sharing in the profits at any rate, profits all round, leaving the quarrelling with subscribers to the company.

Sometimes the thing works the other way about, as in the present crisis wherein there appears to be a big deficit on the part of everyone.

If the figures look attractive to American professional eyes at first blush, considering that dollar gas is the generally accepted standard of payment, they will be still more favorably regarded when it is recognized that there are all manner of side-shows contributing to further profits.

The annual upkeep charges, rentals of meters, of branch piping, of meter connections, etc., account for something more than 25 per cent in addition to the quoted price for which the consumer may legally be charged.

One has only to analyze his yearly gas bills, when, if he is a small consumer, these "overhead" charges are truly onerous for him and exceedingly profitable for the company. Two yards of lead pipe and a valve rented at $3.60 per annum is good business.

Company Has Big War Time Deficit

The company inspector of my own quarter told me the other day that during the two years of war the company had a deficit of 14,000,000 francs on the operation of its gas-plant alone. Incidentally up to now the Paris metropolitan district gets its gas for the same price as it did before the war, nearly two years ago.

If there is any complaint entitled to bloom forth full-grown and justifiable right now it is that of the company. How many mobilized soldiers whose families are still burning gas and not paying for it there are in the Paris district I have no way of knowing, but the gas company has, though it does not mention the fact.

These accounts in arrears may be included in the deficit or may not be. The circumstance is tragic for the company in either case.

What the company does not make mention of is the business it may be doing, and the profits it may be piling up from the by-products so badly wanted and so largely used for explosives, and for coke sold at prices treble those of before the war.

The inspector sidestepped the question when I put it to him and replied that that of itself has nothing to do with the supply of gas to the private consumer—and it hasn't. What he did say, and reiterate, was that, since the municipality shared in the profits of pre-war gas production, they ought now to be willing to help with the losses on the same scale.

Theoretically, of course, they ought, but war changes all things, above all, contracts.

Most municipal partnerships are one-sided affairs—always on the side of the municipality, never a kind word for the soulless corporation which chiefly gets, though not often does it merit it, the contempt and contention bestowed upon a step-child twice removed.

No Rise in Price of Gas

That the price of gas has not risen to the consumer, though that of coal has gone from $8.00 to $30.00 a ton is a godsend to the French housewife.

Those of the profession have always argued for the cheapness of gas as a cooking medium. In France, and, doubtless, elsewhere, it has chiefly been so used, however, for convenience sake, ignoring totally the economic aspect thereof.

To-day the veriest tyro can figure the saving, if not precisely

at least roundly, even by rule of thumb. Psychologically this leads to carelessness, *gaspillage*, wastefulness, and the gas bill goes ever soaring upward, though still it runs a brilliant second to that of coal.

This is sufficient for the French *bourgeoise* mind; the fact that there is an economy to be made in operation. That it is more sanitary, or healthful, matters not a bit. The only thing that matters is that it is cheaper, or they think it is, which it really is, and probably was on the former scale though they couldn't then see it.

The spirit of the Missourian is strong in the French. They are not mean, not even close, but they want to see where it goes; and they don't trust the gas meter.

In so far as to the Paris Municipality seeing things through the same spectacles as the gas company does—no such luck. It replies to the invitation to come in and help share the losses that it itself is the loser to the extent of 50 millions, partly because of the shortage in its share of the proceeds of gas manufacture, taxes unpaid and other charges which a prodigal Paris population paid for the privilege of living in *La Ville Lumière*.

"That, at any rate, is not our fault," replies the company. *"C'est la guerre,"* and then there is the increased cost of our raw material, the shortage of labor to account for uneconomical operation, and a reduced consumption to curtail receipts and their attendant profits. And what to do! The City Fathers are mum, and so the company shoots another arrow into the air.

Raising Prices in the Metropolitan District

There is only one possibility of getting out whole and that is by raising prices in the Metropolitan district, as was done a few weeks ago in certain provincial towns and in the suburban Paris region itself, a raise from 20 centimes a cubic meter to 25 or 28 centimes, equalling $1.40 and $1.55 per 1000 cubic feet.

With the raw material at the price that it is to-day in France, American gas men can figure for themselves how profitable dollar gas might be! Only with a fifty per cent advance does it seem possible for the companies to avoid loss on gas production and even that is being in business for the love of it.

The *frais generaux*, as the French call overhead, more than absorbs any benefits that may be apparent. Frankly this is the only way the gas companies themselves can help the situation, and in spite of the general inconvenience and expense they have so stated the fact.

If Paris wants its fifty millions otherwise she must borrow it and put it on the taxes, when the public will protest still more. If there is anything the great big general public likes less than gas bills it is taxes.

Consumers Maintain a Studied Silence

The 700,000 gas subscribers of the capital are themselves lying low and keeping mum, and the lower they lie and the more mum they keep whenever their minds wander to the price of candles, kerosene or coal; kerosene being anywhere from forty to sixty cents a gallon and coal hovering around thirty dollars a ton.

Only those who float along on the inner strata of information direct from the Board of Directors of the Gas Company and the Municipal Council really see the problem as it is. It is only a question of whether the gas company is to be the goat or not! The public, of course, doesn't care; that it why it is called the public.

Actually the Société du Gas de Paris has come to a *cul-de-sac*. Doubtless it is nothing serious, but the fact is its annual meeting which was to be held June 20th didn't materialize for the want of a quorum of stockholders. This may have been an inside political move or it may not. It seems strange at all events. Anyway, you can't take the Parisian public into your confidence if you are running a public service institution here; such a thing as an educational campaign or a heart-to-heart talk between producer and consumer was never dreamt of—the two wont, or don't, mix; they are antagonistic from the beginning and yet they both need each other.

For this reason there is little likelihood that the public would ever side with a soulless corporation, even if there were possibilities of undying benefits.

This is the situation in these days of war. What it will be afterwards no one seems to know, but if there are any American specialties susceptible of making life easy and gas bills lower, and heat and light more efficient for the Paris consumer, it is none too soon for the American manufacturer of such an attempt to break into the market.

After the war all manner of private and public interests will be going through a reconstructive period leading towards a greater efficiency, the psychological moment for a change in business policies which even the conventional French—those who know—admit there is a need of.

You can not change a Frenchman's prejudice for canned food, but you can educate him, and above all her, as to the costliness and wastefulness of coal when used directly for domestic purposes, as it is usually bought and made use of here.

Sliding Scale of Rates

Another question which has imposed itself just now—superimposed itself would be more like the word—is that of cheap gas for large usérs—*collectivités* they call them—and high priced gas for private consumers—wholesale and retail if you like to put it so.

Private individuals got together recently in Marseilles in a mild form of a mass-meeting and claimed that since they were the back-bone of the country (each with his *bas de laine* more or less filled with the good coin of the Republic) they were the ones to be favored with low prices, not industry.

This is just the opposite of the science of *economie sociale* with which the whole world has one day or another to occupy itself, but let that pass, merely commenting on the fact that to put the heavy tax on the producer, and let the butterfly element go free, would be like taxing motor trucks and giving a free pass to the pleasure automobiles. This argument would lead to no end if continued, but it is evident that such a procedure as proposed in Marseilles would work disadvantageously in the long run; encourage private producer plants, and both the gas companies and the profit-sharing municipalities would suffer.

The other side has had its say and protested successfully up to now, and the Union of Commercial Gas Users has gotten the support of the government for their claims that such a rule would be an unfair tax on industry, which is the root of all prosperity. That industry should not benefit from quantity price, or special service, is not to be thought of, thus the private user is on the threshold of having to meet an increase in rates which will certainly be put in force in very short order, certainly before the autumn season sets in and the "legal hour," as moved back sixty minutes as provided by a Decree passed in the Senate and Chamber of Deputies a month ago. It is but just.

Various Solutions Proposed

Various solutions have been proposed—raising the rates as at Bordeaux, in suburban Paris, at Bolbec—a cloth manufacturing town in the north of France—or at Annecy—a lake resort in Savoy. This, or that the municipalities should release their rights to their *quote-parte* of the profits, where associated with the operating company as is so often the case here, notably at Verberie and at Paris itself as has been shown.

The situation in Marseilles has actually resolved itself as follows: The company is free to make what conditions the state of industry demands, disregarding what may ultimately, of necessity, be imposed upon the private user, so long as the municipality is not called upon to pay up or make good any deficit of receipts from other sources than "industry" because of a falling off.

From 17 centimes the price has been advanced to 25 centimes the cubic meter, as a result of gas coal being laid down on the wharves of the ancient City of the Phoenicians at a price the equivalent of $26.00 per ton to-day as compared with $5.60 before the war, these prices being furthermore paid in sterling at 28 francs the pound as against 25 francs 15 centimes of normal times, an increase of another 10 per cent on top of the price given.

Gas Consumption in Modest Homes Very Small

To the American producer these figures would seem impossible—they would be so here but for side issues. In reality the gas consumption in the most modest homes is very little,—they are small consumers so to say—but, on the other hand, gas-lighting in public places, cafés, restaurants and street lighting seems to be far in excess of what it is in the United States, in actuality and in proportion, as near as can be judged without going into figures.

This perhaps makes for cheap gas, or ought to, though there is nothing here as cheap as eighty cents and never will be. Were it not for by-products of wartime, and benzol of before the war for the Paris taxies, and exceptionally favorable municipal co-operation, a gas company would hardly be a possible money maker in competition with the hydraulically generated electricity now possible to lead over great distances.

Prices in Spain Double Those in France

Just across the Gulf of Lyons from Marseilles, lies Barcelona, the chief commercial industrial city of Spain where I spent three years and saw some things not generally floating on the surface. In that which concerns gas, its manufacture and supply, there are some curious anomalies, not the least being that the price is double in the commercial capital of Spain to what it is in Marseilles. The supply of raw material comes from the same source, and the company is French controlled and managed.

Thirty-five centimes a cubic meter is considerably more than double seventeen centimes, for, at the moment the Spanish *peseta,* for the first time in the history of European finances, is at premium of 20 per cent over the French franc.

This figures Barcelona gas at about forty-two American cents a cubic meter, say 2 dollars and 25 cents a thousand cubic feet.

This would seem to be the most interesting thing going in Europe to-day—except for the cost of the raw material being what it is. All the same everyone in Catalonia, the only really active industrial province in Spain, has got the bump of commercialism highly developed, and, as a rule, anyone but a blind guitar player can make big and easy money at anything within sound of Barcelona's night and day Ramblas.

Perhaps it is the fact that on the Ramblas you may get shaved at three o'clock in the morning and supper a couple of hours before, which accounts for the large dividends and high prices of the Barcelona Gas Company. There is an enormous consumption per head to begin with. The French themselves evidently discovered that there was more money in gas out of their own country than in it.

Factor in Operation of Any Plant

A factor which has a considerable bearing on the operation of any plant with anything more than a summary coal consumption is the fact that coal is "taxed" at the pits mouth; i. e., the price at which it is sold is regulated by law, the same with imported coal at the port of delivery in France.

A dangerous illusion recently emanated from one of the great Mediterranean ports to the effect that the price of coal would soon drop 35 per cent as to prime cost, and 45 per cent as to freights from the United Kingdom, or from United States ports. It doesn't look like it now, and it was evidently a piece of bluff on the part of the retail gas users' combine to keep a projected rise of from 17 to 25 centimes from materializing.

Largely coal for all uses is imported into France from England (formerly largely from Belgium and Germany, with easy and cheap transport by canal and river). Up to now, since the beginning of the war, England is supplying 20 million tons a year, the consumption for all purposes in France to-day being about double that figure, and in pre-war times triple.

There is, of course, a marked insufficiency of French supplies owing to the mines being mostly in the invaded regions, but had it not been for the unholy attitude of the Mine Workers Union in not allowing Italian laborers to the number of ten thousand to be brought in for the government account, it is estimated that France might even have produced 7 million more tons than at present.

This would have reduced the importations from 20 millions to 13 millions, or, if needed, would have allowed the 20 millions to have increased to 27 millions. This would have relieved the situation, not only for the ammunition factories but for the gas companies, not only with respect to gas for private consumption, but for the by-product output. It would also have made available increased tonnage from abroad for anything which might otherwise be needed. Some of the high cost of French gas these days has helped to make Norwegian and Swedish ship owners millionaires.

Labor Still Has Important Voice

Labor, in wartime even, is still considerable of a force; perhaps it is right that it should be, but not at this time. The motto is, or should be, *"One for All and All for One,"* the same that has gone echoing down the ages since the elder Dumas put it into the mouths of D'Artagnan and his fellows.

Had there been martial law in France the thing would have been different; which makes one wonder after all if war is not everyone's business, and should not everyone "do his bit," as is the smug English way of putting it? Well, there is no doubt but that the French gas companies have done their "bit," and done it well and graciously, if a deficit of 14 millions on gas operations in Paris alone stands for anything, and the returns from the countryside are something notable in addition.

The electric companies are largely in the same box, though in Savoy, on the Riviera, in the Pyrenees and in the Central Plateau these largely get their alimentation from hydraulic power what the French call *houille-blanche,* literally "white coal," or water power, and are therefore less hard hit, though they have felt their hurt in the lack of bulbs which were chiefly of German manufacture, as were lamp chimneys for oil lamps.

Within the last thirty-six hours has come another blow which may have a boomerang effect on many things of the future, the price of coal not being left out. The gas companies may yet be able to see daylight—or they may not. It all depends.

Germany's ultimatum to Switzerland to the effect that if that country does not take off the export embargo on certain products Germany will cease to sell her coal.

Switzerland is the ham in the sandwich, and a thin slice at that. If she rejects Germany's proposition France will have to supply her with coal, and France is anything from 10 to 12 millions of tons short now, and with an increasing demand.

Switzerland's coal from Germany has been costing not more than 38 francs the ton, delivery by rail from the Westphalian fields, whilst if she gets her supply through France or Italy (a thing not impossible of accomplishment by the Allies even in these strenuous times) it will cost at least 200 francs the ton, say forty dollars.

Switzerland Must Have Coal

Politics apart Switzerland has got to have coal, whether she gets it through France or Italy, or from Germany, but if she changes her coal dealer now she may be laying up trouble for herself for future supplies.

A short rail haul from the German mines is more than a successful weapon with which to attack British or American coal imported through Marseilles or Genoa, 500 kilometres away and all up hill, with a sea transport of from 1,200 to 3,000 miles to begin with.

France for a long time to come will have none of her own to spare though she is daily drawing up on her invaded coal regions of the Department of the North. As the note-writers, diplomats and attachés put it; the situation is delicate.

Just as these lines are being closed it is learned that the Paris Municipal council has granted permission to the Paris Gas Company to borrow (if it can) 40 million francs to meet the following "extraordinary expenses:" Payments being made to its mobilized personnel in the form of salaries not earned by reason of military service on the front; the high cost of prime material; the diminution use of gas by the public, and attendant reduced receipts.

Truly it is something near a crisis. It is not serious in that it attacks anything French vitally; it is proof of the steadfastness of the nation that it will hold out somehow and meet the situation. But it is something which is bound to bring regrets in its train when measured by dividends—and fifty per cent of the French live, at least in part, on dividends or *rentes* of one sort or another.

Massachusetts Commission Names Plants for Experiments on Calorific Standard

The following gas companies have been designated by the Massachusetts Gas & Electric Light Commission as the ones to be utilized by the board for experimental and testing purposes, in connection with an inquiry now going on relative to the establishment of a calorific standard in the state: Attleboro Gas Light Corporation, the Lynn Gas & Electric Company, the Suburban Gas & Electric Company, and the Taunton Gas Light Company.

A large number of plants were offered for the purposes mentioned, but the Commission selected the above as being typical of plants operating under varying conditions, and in varying capacities of output.

Heating by Gas Worth Millions to City from Viewpoint of Smoke Abatement Alone

A correspondent—presumably a layman—wrote the following letter for publication in the *St. Louis Post-Dispatch:*

"The gas company, admittedly in its own interest as well as the public's, seeks to change the basis of charge from candle power to heat units.

"As immeasurably more gas is used for heating, cooking and incandescent lighting than for illumination by open burners, the arguments adduced seem plausible.

"If it can be proven that the saving effected will benefit the consumer equally with the producer, no 'dog-in-the-manger' policy should prevail.

"This seems an opportune time to agitate the subject of domestic efficiency, as applied to the 'burning' question of house heating.

"Gas is unquestionably the ideal fuel for heating purposes, and only the cost prevents its almost universal use. The advantages, when compared with coal or other heat-making substances, are too well known and admitted to need mention. It being an axiom of trade that the volume of business rather than the percentage of profit determines the earning power, the writer wonders that the Laclede Gas Light Company doesn't offer reduced rates for gas used in heating.

"This would stimulate invention and doubtless develop practicable devices for utilization of the gas.

"There are many thousand residents who would cheerfully pay a few dollars more each month for the heating of their homes to secure this coveted blessing.

"Incidentally, but of equal importance, it would help materially in mitigating the 'smoke nuisance'—the greatest of all the handicaps St. Louis has to contend with. Even its partial abolition would be worth millions of dollars annually to the city."

Effects of the Thrift Habit

Thrift is the foundation of character. The employee who learns to manage his personal affairs so that he may save some part of his earnings, will use, after the habit is once formed, the same care in saving his employer's time and material. As his savings account grows, he becomes interested in his town. The fact that he has a few dollars in the bank soon gives him a feeling of security, which in turn makes him a safe man. As his mind is on his work, the work improves, and accidents diminish.

The man with a bank account is able to stay with a concern during a period of depression, or when the shop has a dull season and is working only part time. According to statistics, ninety-eight per cent of wage earners spend every cent they make between pay days. As soon as they have sickness or slack time they cannot pay their bills, and as soon as they use up what little credit they have many jump to a new town, often just when the tide turns and the shop is getting busy. The argument is that they owe so much money it will take all their wages for some time to come to pay old bills. It is to steady this class of labor that saving should be made easy. If an employer, by the expenditure of a little time for clerical work of some member of his office force, can induce and help a percentage of his employees to save, is he not securing the nucleus of a steady class of help—men and women who can be depended on to stick? The larger their bank account grows, the surer he may be of their services. If you had an important place to fill and two applicants for the job, of equal ability, one that you knew had a savings account, and one that you knew had nothing ahead, which would you employ? Would it not be wise to make an effort to lift all your employees to the level of your choice?—*American Industries.*

Secondary Metals to Value of $114,304,930 Recovered from Scrap in 1915

During the year 1915 secondary metals were recovered from scrap, sweepings, etc., in the United States to the value of $114,304,930, according to the annual statement on secondary metals issued by the U. S. Geological Survey.

A Close Reading of Current Literature Fails to Reveal Any Marked Improvement in Electric Cooking Appliances

Gas Men Should, However, Keep Themselves Fully Informed as to Development Along this Line—Competition Likely to Become Acute Due to Desire of Electric Companies to Secure Consumption During Light-Draft Period

By A. S. B. LITTLE

Gas Engineer, of the Illinois State Public Utilities Commission

A very close reading of current literature fails to reveal any marked or remarkable improvement in electric cooking appliances, other than might be strictly termed "table conveniences."

Gas men, however, should keep themselves fully informed as to the progress that is being attempted with electric cooking appliances, as competition from this source is likely to grow intense, due to the desire on the part of the electric industry to increase consumption during the period of light draft.

In recent cases where electric rates have been under consideration, some interesting testimony has been offered in respect to low rates that are suggested, which would enable the electric companies to make a strong effort to secure the off-peak load, that they believe is now dormant but can be made active through the introduction of electric stoves. The following might be taken as a fair sample of such testimony:

Q. In a rate proceeding, if the value of the property, the cost of producing the service, the net income which the company is entitled to, and the amount of depreciation is determined, then the working out of the schedule has in mind those rates that would be just and equitable between the consumers, and to produce the income to the company that will give it a return of all these things that I have mentioned. Is that true or not?

Q. As in a case in which schedules of rates were recently filed

Q. As in a case in which schedules of rates were recently filed with the commission, more particularly alluding to heating and cooking rates, in which they have made an exceptionally low rate in comparison with the other rates?

A. Yes, very decidedly so.

Q. Do you know their reasons for it?

A. I know the reasons that they state. It appears that electric ranges have been developed in the last two or three years to a point where they are more economical than they were formerly, and that a great many electric companies feel that there is a field of business which they should go into.

In order to get the business it appears that the rates that they make must be in the neighborhood of 3 cents per kilowatt hour in order to compare with gas at a dollar.

That is another illustration of the value of the service to the consumer; that is, experience has proven that a consumer will pay about 3 cents a kilowatt hour for current for cooking purposes as compared to paying about a dollar a thousand feet for gas, and a great many of the companies felt that they could enter into a profitable line of business in the heating and cooking field.

The reason why they apparently feel that that would be an especially profitable line is that the residence distribution circuits of the company are unloaded; that is, are without load, for about 20 hours of the day.

The poles are there and the wires are there, the transformers are there, but they are practically doing nothing and the electric companies feel that they can utilize the investment in those residence circuits to a larger extent than they have in the past; that pretty nearly everything that they get in the way of revenue will be clear gain outside of the cost of generating the current which is very small, and they feel that, if they can get that business at such rates, that they are justified in taking it; that it ought to be considered as excess cost or increment business; that is, that they ought to be allowed to take it at rates which will net them a profit over the extra expense which they are put to for furnishing it rather than a profit over the proportionate expense of all the service.

It also appears that the class of service is pretty largely off the station peak, that the maximum load occurs just prior to the noon hour.

Most Economical Method of Disposing of Peat is to Convert it Into Gaseous Fuel in Suitable Gas Producers

Experiments Demonstrate that Peat Containing a High Proportion of Moisture Can Be Gasified so as to Yield Gas of High Calorific Value with Good Recovery of Nitrogen in Form of Ammonium Sulphate

The most economical use to make of peat is to convert it into gaseous fuel in suitable gas producers. When so treated the products obtained, in addition to gas, are ammonia, ash, tar and an aqueous distillate containing technically important organic compounds. Experiments have demonstrated conclusively that peat containing a high proportion of moisture can be gasified so as to yield a gas fuel of high calorific value, and a good recovery of nitrogen in the form of ammonium sulphate. These statements were made by Gilbert T. Morgan, professor of chemistry in the Faculty of Applied Science, Royal College of Science for Ireland, in the *Journal* of the American Peat Society. The following is an abstract of Mr. Morgan's paper:

Peat Producer Gas Free from Sulphur

When peat is treated in a gas producer the products are combustible gas, ammonia, ash, tar and an aqueous distillate containing certain technically important organic compounds. The combustible gas, which is comparable in calorific power with that obtained from lignite, consists of carbon monoxide and hydrogen mixed with the non-combustible gases, nitrogen and carbon dioxide.

The peat producer gas is generally free from sulphur, the absence of this element being of great advantage in a gaseous fuel used in iron and steel industries and in the manufacture of glass and ceramic wares.

Peat may contain 0.5 to 2.5 per cent of nitrogen, and in recent years considerable improvements have been made in the way of increasing the yield of ammonium sulphate recoverable from this combined nitrogen.

Caro has raised the yield to 85 per cent of the total nitrogen working on peat containing 60 per cent of water.

Similar improvements have been embodied in the modern types of Mond plant so that now it is possible to recover the greater part of the nitrogen of peat in the form of the valuable fertilizer, ammonium sulphate. The other commercial nitrogenous fertilizer is sodium nitrate, a substance also required in the manufacture of nitric acid as a starting point in the production of explosives and synthentic dyes.

The importance of increasing the output of ammonium sulphate from peat lies in the circumstance that this salt can displace sodium nitrate as a nitrogenous manure, thus rendering the nitrate available for the manufacture of explosives and other chemical products.

Large Scale Experiments Made

The Simon-Carves By-Product Coke-Oven Construction & Working Company, Limited, has made large-scale experiments on the gasification of peat in Moore gas producers. Peat, containing 63 per cent of moisture, and with a nitrogen content of 2.235 per cent, yielded per ton 94,850 cu. ft. of gas (100 B. t. u. per cubic foot) and 168 lb. of ammonium sulphate. A longer run would certainly have given even more of this salt.

These experiments demonstrate conclusively that peat containing a high proportion of moisture can be gasified so as to yield a gas fuel of high caloric value with a good recovery of nitrogen in the form of ammonium sulphate.

Incomplete Combustion Leads to Formation of Tar

The incomplete combustion of peat in the producer leads to the formation of a certain proportion of tar which is collected in the hydraulic scrubbers of the plant.

As the result of many trials made at the fuel-testing station at Ottawa it was concluded that the tarry components of the gas evolved in the upper zones of suitable producers could not be entirely burnt or split up into permanent combustible gases. The condensation of a certain amount of tar is unavoidable, and special means of removing this by-product must be adopted.

A greatly increased output of the peat tar is the first essential step towards commercial success in this direction. This increase would result naturally from the installation of large plants for the gasification of peat, or from an increase in the number of factories using gas derived from peat.

Aqueous Distillate from Peat Tar

The aqueous distillate from the producer contains in addition to ammonia certain organic substances soluble in water, among which have been recognized methyl alcohol, acetone, acetic acid and its immediate homologues, and pyridine bases.

All these compounds are of industrial importance. Methyl alcohol is an important solvent and the starting point for formaldehyde. Acetic acid and its homologues are required for the manufacture of acetone and other ketones. Acetone is an important solvent used in considerable quantities in the manufacture of the explosive, cordite. The pyridine bases are pungent liquids useful both as solvents and as disinfectants. The recovery of these compounds could be rendered practicable by suitably modifying the condensers and scrubbers of the peat producing plant.

Travancore Monazite Contains Twice as Much Thorium as Does That of Brazil

The coast sand of Travancore is rich in monazite, and the latter contains nearly twice as much thoria as the monazite of Brazil.

Since the European war, the control of these sands has passed from German interests to an English company which has given rise to the hope in that country that the output will make the gas mantle industry in England independent, for all times, from German control of monazite.

Some time ago scattered deposits of monazite were found in Ceylon, which contained over 80 per cent of thoria, as against about 5 per cent in the Brazilian monazite. This provided grounds for the belief that the material should also be found in India, and government investigations bore out the belief. In 1909 a German prospector discovered the deposits on the coast of Travancore. Analysis showed the sand was rich in monazite, and that the mineral contained nearly twice as much thoria as the monazite of Brazil.

The Travancore Minerals Company was subsequently formed under German control, and the monazite worked by German interests.

In addition to the area dealt with by this company there are other areas of Travancore sands which are to be worked by a second British company.

Decrease Shown in Coke Oven Accidents in 1915

Reports received from the operators of coke ovens show a decrease in the number of fatalities and injuries during the year 1915 as compared with 1913 and 1914. The number of men killed in 1915 was 38, as compared with 45 in 1914, and 46 in 1913. The total number of men reported employed for 1915 was 31,060, as compared with 22,313 in 1914. The fatality rate in 1914 was 2.02 per 1,000, and in 1915 it was 1.22. The injury rate in 1914 was 98.11 per 1,000, and in 1915 it was 91.82 per 1,000 men employed. Of the total number of non-fatal injuries in 1915, none was reported as causing permanent total disability, whereas 50 were reported as causing permanent partial disability.

Creosote Which Would Meet Highest Specifications and Requirements Could Be Produced in This Country Without Difficulty

To-day Production of Coal Tar from Coke Ovens Alone is Sufficient for the Manufacture of 80 Per Cent of the Creosote Needed in Wood-Preserving Industry—With By-Product Ovens Now Being Built or Projected Quantity Available will be increased from 50 to 60 Per Cent.

Piles of track-ties, dark with creosote or some mixture thereof, are now a familiar sight along the right of way of railroads, both East and West, and one is impressed that preservative treatment of this class of track-materials has come to stay, states the *Railway Review*. The experience with treated ties in this country, on any considerable scale, dates practically from about 1885. The use of creosote for treating ties, however, did not begin with much earnestness until about ten years ago, but it is now being employed extensively and in increasing quantities.

Set-Back in Industry Feared

When the European War began it was feared that this industry might be given much of a set-back, owing to the cutting-off of the importation of the German oils. Not only were large quantities of creosote being imported from Germany, but the German article was superior in grade to that which was being imported from England.

The result of the war on the creosote supply, as well as on the grade of the article, has, however, been unexpected, for not only have larger quantities been imported from England than ever before, but the quality of the oils from that source has been greatly improved, until they now excel those of German manufacture.

The cause of this situation has been the greatly increased quantities of coal-tar distilled in England for the production of munitions.

Fortunately for the timber-preserving interests, the distillates from tar that are most useful for making munitions are those that pass over at the lower temperatures of the process, or the most volatile products, so that the further distillation of the residue into creosote produces the heavy oils that volatilize slowly and are recognized as the most valuable ingredients for creosote for timber-treatment.

Can Produce Creosote of Highest Grade in this Country

Regarding creosotes of American manufacture, there have been two popular misconceptions, one being that the American oils were necessarily of inferior grade, and the other that there was not, or is not, sufficient raw material to produce the quantity that is needed for wood-preservation purposes.

While a great deal of American creosote-oils on the market have been of the volatile character, there has never been a reason why this should be so except that of expedieney on the part of tar-distillers, whose chief aim was to utilize other products or by-products of tar-distillation and produce only such quantities of creosote as came off incidentally to the main purpose.

The question of the quality of American creosote is one as to whether the manufacture of it is the main purpose of the producer or only an incidental one.

There is no difficulty whatever in producing oils that meet the highest specifications and requirements, if only the manufacturer aims to do such. The proof of this assertion is that heavy oils of American manufacture are available that surpass the best commercial product of Germany in evaporation tests.

Future Possibilities

As for the supply of the raw material in this country, there might always have been a larger production of creosote had it not been for waste of tar, some of this being deliberate.

To-day the production of coal-tar from coke-ovens alone is sufficient for the manufacture of 80 per cent of the creosote that is needed in the wood-preserving industry. But the production of coal-tar is about to be largely increased.

With the by-product coke-ovens built, being built, and projected, the quantity of coal-tar available will soon be increased 50 to 60 per cent, or enough to supply more than all the raw material needed for our creosote supply.

Coke Production in 1914 Over Ten Times Total Amount Produced in 1880

The accompanying table, compiled by the U. S. Geological Survey, shows that the coke production in this country in subsequent years has increased many times over the total tonnage produced in 1880, and that the percentage of yield from the coal has increased almost 4 points.

Year.	Establishments.	Number of ovens.	Coal Used (short tons).	Coke produced (short tons).	Value of coke	Price per ton	Percentage of yield of coal	Number
1880	186	12,372	5,237,741	3,338,300	6,631,267	$1.99	63.0	3,142
1881	197	14,119	6,546,662	4,113,760	7,725,175	1.88	63.0	.....
1882	215	16,356	7,577,648	4,793,321	8,462,167	1.77	63.0	.....
1883	231	18,304	8,516,670	5,464,721	8,121,607	1.49	64.0	.....
1884	250	19,557	7,951,974	4,873,805	7,242,878	1.49	61.0	.....
1885	233	20,116	8,071,126	5,106,696	7,629,118	1.49	63.0	.....
1886	222	22,597	10,688,972	6,845,369	11,153,306	1.63	64.0	.....
1887	270	26,001	11,859,752	7,611,705	15,321,116	2.01	64.0	.....
1888	261	30,059	12,945,350	8,540,030	12,445,963	1.46	66.0	.....
1889	252	34,165	15,900,973	10,258,022	16,630,301	1.62	64.0	8,998
1890	253	37,158	18,005,209	11,508,021	23,215,302	2.02	64.0	.....
1891	243	40,245	16,344,540	10,352,688	20,323,216	1.97	63.0	.....
1892	261	42,002	18,813,337	12,010,829	23,536,141	1.96	64.0	.....
1893	258	44,201	14,917,146	9,477,580	16,523,714	1.74	63.5	.....
1894	260	44,772	14,348,750	9,203,632	12,328,856	1.34	64.0	.....
1895	265	45,565	20,848,323	13,333,714	19,234,319	1.44	64.0	.....
1896	341	46,944	18,694,422	11,788,773	21,600,729	1.84	63.0	.....
1897	336	47,668	20,907,319	13,288,984	22,102,514	1.66	63.5	.....
1898	341	48,383	25,249,570	16,047,209	25,586,699	1.59	63.6	.....
1899	343	49,606	30,219,343	19,068,569	34,670,417	1.76	63.1	16,999
1900	396	58,484	32,113,553	20,533,348	47,443,331	2.31	63.9	.....
1901	423	63,951	34,207,965	21,795,883	44,445,923	2.04	63.7	.....
1902	456	69,069	39,604,007	25,401,730	63,339,167	2.49	64.1	.....
1903	500	79,334	39,423,525	25,274,281	66,498,664	2.63	64.1	.....
1904	507	83,599	36,531,608	23,661,106	46,144,941	1.95	64.8	18,981
1905	519	87,564	49,530,677	32,231,129	72,476,196	2.25	65.1	.....
1906	532	93,901	55,746,374	36,401,217	91,008,034	2.52	65.3	.....
1907	552	99,680	61,946,109	40,779,564	111,539,126	2.74	65.8	.....
1908	551	101,218	39,440,837	26,033,518	62,483,983	2.40	66.0	.....
1909	579	103,982	59,354,937	39,315,065	89,965,483	2.29	66.2	29,273
1910	578	104,440	63,088,327	41,708,810	99,742,701	2.39	66.1	.....
1911	570	103,879	53,278,248	35,551,489	84,130,849	2.37	66.7	.....
1912	559	102,230	65,577,862	43,983,599	111,805,113	2.54	67.1	.....
1913	551	102,650	69,239,190	46,299,530	128,922,273	2.78	66.9	.....
1914	536	99,755	51,623,750	34,555,914	88,334,217	2.56	66.9	.....

Greater Proportion of Injuries to Employees in By-Product Ovens Than in Bee-Hive

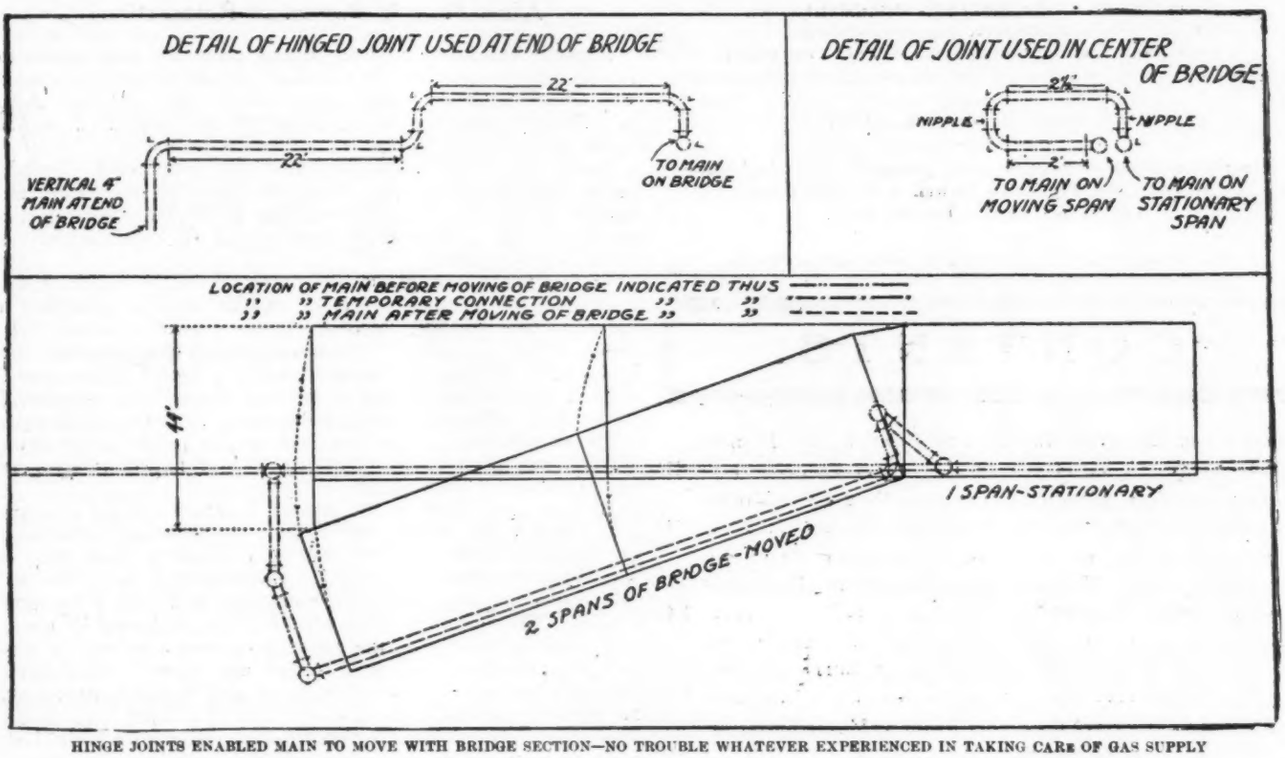
During the year 1915, 17,699 men were employed at bee-hive coke ovens, and 13,361 were employed at by-product plants. The number of men killed at bee-hive ovens was 10, whereas 28 were killed at by-product ovens. There was also a correspondingly larger number of injuries at by-product than at bee-hive ovens. The fatality rate at bee-hive ovens was 0.57, and at by-product ovens it was 2.10. Serious injuries at bee-hive ovens were 9.41, whereas at by-product ovens they were 24.40 per 1,000 employed.

This wide difference may be due in part to the manner of reporting accidents, as it is possible that the companies operating the by-product ovens are keeping somewhat better records and making fuller and more complete reports than are many of the operators of the bee-hive ovens. The figures given, however, do not cover a sufficient period to warrant any decided conclusions respecting the comparative hazard of these branches of the industry.

Hinge Joints in Mains Prevent Shutting Off of Service to Consumers During Bridge Moving

Shifting of Bridge Was a Slow Process and Would Otherwise Have Made Necessary Discontinued Service for Several Hours—No Trouble Was Experienced with Mains During Actual Moving.

To avoid shutting off the service from 200 stoves in North Mankato, Minn., during the shifting of two sections of the bridge over which the supply mains were laid, the Northern States Power Company resorted to the novel method of placing hinge joints in their mains, so that they could move in accordance with the bridge sections and still carry their supply of gas.


DETAIL OF HINGED JOINT USED AT END OF BRIDGE
22'
22'
VERTICAL 4" MAIN AT END OF BRIDGE
TO MAIN ON BRIDGE
DETAIL OF JOINT USED IN CENTER OF BRIDGE
2½"
NIPPLE
NIPPLE
2'
TO MAIN ON MOVING SPAN
TO MAIN ON STATIONARY SPAN
LOCATION OF MAIN BEFORE MOVING OF BRIDGE INDICATED THUS
" " TEMPORARY CONNECTION " "
" " MAIN AFTER MOVING OF BRIDGE " "
44'
1 SPAN-STATIONARY
2 SPANS OF BRIDGE-MOVED

HINGE JOINTS ENABLED MAIN TO MOVE WITH BRIDGE SECTION—NO TROUBLE WHATEVER EXPERIENCED IN TAKING CARE OF GAS SUPPLY

North Mankato lies immediately across the Minnesota River from Mankato, and there are some 200 stoves in service there that the gas company did not feel like putting out of commission during meal hours. So the hinge joints were placed in the mains the day before the shifting of the bridge was to be done. The latter work was a slow process, and had not this expedient for continuing the service been adopted, the North Mankato consumers would have been deprived of the use of their ranges for breakfast and dinner.

The two sections of the bridge in moving were kept as one unit and treated as one span. One end was moved 44 ft. The other end opened up only as a hinge. No trouble whatever was experienced in taking care of the gas supply, and none of the consumers were inconvenienced except for a short time, between 2 and 3 o'clock in the afternoon, while the hinge joints were being placed.

This journal is indebted to R. E. Brown, manager for the Northern States Power Company at Mankato for the foregoing information.

Sales of Lime in the United States Increased 6.2 Per Cent in 1915

The lime sold in the United States in 1915, according to the U. S. Geological Survey, amounted to 3,589,679 short tons, valued at $14,336,756, an increase of 6.2 per cent in quantity and 8 per cent in value over the figures for 1914. The average price per ton, $3.99, was 7 cents more than that of 1914. The value of lime sold for chemical works, sugar factories, fertilizer, steel works and miscellaneous purposes increased and more than offset decreases in the value of lime sold for building, paper mills, and tanneries. The number of plants in operation decreased from 954 in 1914 to 905 in 1915, and the number of kilns in active operation from 2,406 to 2,331.

Sales of hydrated lime continued to increase in 1915, amounting to 581,114 tons, valued at $2,457,602, an increase of 12.8 per cent in quantity and 9.7 per cent in value over the sales in 1914. The average price per ton in 1915, however, dropped 12 cents, to $4.23.

Establish Dollar Gas Rate at Jacksonville, Ill.

The Illinois Public Utilities Commission, July 16, fixed the gas rate at Jacksonville at $1 per 1,000 cu. ft. The rate was made on the basis of a $200,000 valuation of the gas company property.

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Paying the Wartime Gas Bill in France

The article on the situations the French gas companies are facing as a consequence of the war, which appears on page 83 of this issue, will prove of interest and value to the American gas man. The article came to us direct from Paris, of which city the author is a resident, and was "passed by the censor."

Although written in a less sedate tone than is customary in technical journals, facts are not sacrificed to secure a pleasing effect. The author's style is light and makes easy reading, but a careful analysis will show that he knows whereof he speaks. The result is an instructive and interesting article.

Absurdities in Pavement Restorations

Highway engineers, in their groping about for some means to remedy the condition of city pavements, sometimes lay down some very absurd and impractical specifications. For example, there has recently come to the attention of this journal a set of "cure-all" specifications from a southwestern city.

These require a reinforced-concrete slab over trench openings before relaying pavements. First, the edges on both sides are beveled down, then the slab—varying in thickness and in the amount of the reinforcement according to the depth and width of the cut—is placed.

Such a foundation should undoubtedly hold the pavement up, even if all the covering over the subsurface structure disappeared entirely. One wonders, however, why the backfilling is necessary at all. Since so elaborate a roof is necessary, why not place side walls, and, perhaps, a floor and call it a vault? This would, without question, save money in the long run, and the slab should certainly be sufficiently strong, as specified, to serve a vault-roof.

The shortcoming in these specifications lies in the fact that no thought was given to the possibility of ever having to open up the pavement on other occasions.

We have great faith in the manner in which our gas companies do their work. Aside, entirely from the pride any honest man or corporation takes in a job well done, a poorly made joint is as much to be deplored by the gas company as it is by the city. Bad joints are responsible for leaks, and leaks are a constant expense. There is no question whatever that, in laying its mains or in making its repairs, the company endeavors to make a perfect job. But quite frequently it does not succeed. Such shortcomings are a part of our daily existence, and, though exasperating, are almost inevitable. A main once laid or a repair once made, does not necessarily indicate that that particular work is finished, much as we would wish it would. What is said of gas companies can be applied equally well to water companies and electric companies.

Consequently, some thought should be given to the future. Permanent galleries for subsurface structures would unquestionably, to a large degree, solve the problem of faulty pavement conditions, due to improper or imperfect backfill over street openings. But such galleries would cost a large sum of money and they have not proved practical for gas. It is questionable even if they would be truly economical. Until this question is decided we will continue to grapple with the problem of proper restoration of street pavements. Fancies, mere imagination or absurd requirements will, however, take us no nearer to a satisfactory solution. Such a problem requires, above all, cold common sense, and a clear conception of all the conditions involved.

Installation of Uneconomical and Unsatisfactory Ranges Should be Discouraged

If one were to ask a tenant of the average apartment house, whose landlord buys his gas ranges outright, and furnishes them free with the apartment, as to his opinion in regard to the relative advantages of gas as compared to coal for cooking, the reply would be very discouraging in the majority of cases. He knows of gas only through his own experience, and as used in the particular appliance with which he has been supplied.

He does not know the underlying reason for the unsatisfactory

service that he has been receiving; that the landlord has bought his ranges entirely on the basis of the first cost, and without regard to the amount of fuel they will require to do a certain amount of work.

As a result, such tenants—and the number is legion—are by no means ardent advocates of gas for cooking. High bills and unsatisfactory service have been the sum total of their experience.

A very large number of such tenants are looking forward to the day when they will be able to secure a home in some outlying section. They are by no means permanent apartment dwellers. Those who do seldom think of a gas range to do their cooking. In fact, that is one of the disadvantages of apartment life they seek to be free from.

It is a very short-sighted policy for a gas company to furnish and install, at a landlord's behest, ranges that it knows are neither satisfactory nor economical. Too much money is invested in the business for it to forget the market of to-morrow in the larger profits of to-day.

How it can avoid doing so, or have the discomforture of seeing some dealer furnish the cheaper article, is a problem that will require some thought to work out, but the ultimate reward will be well worth the effort. Some landlords will unquestionably be but slightly impressed by the argument in regard to the fuel consumption, since they do not pay the gas bill, and they do pay the cost of the range. The question of satisfactory service may also impress them but little. Complaints in regard to such matters are too easily saddled on to the shoulders of the gas company.

One way to inspire them to buying better ranges might be to supply them with "selling talk," to be used in gaining new tenants. Figures in regard to the relative cost for fuel in the more expensive ranges as compared to those ordinarily used, would be very effective in convincing a homeseeker that the apartment he was looking over was in a house of the first grade, and under efficient and attentive management.

The matter of gas ranges in apartment houses is one of great importance to gas companies in large cities. In these days when so much money is being spent to secure new customers we cannot afford to drive away those we already have.

Constant Progress Improvements Necessary in Gas Lighting

Though by no means advocating the continued use of open jet burners, this journal cannot refrain from pointing out that there is possibly no better proof of the stability of gas lighting than that to-day there can be found in use thousands of gas burners which are not essentially different from the first burners used one hundred years ago. As a matter of fact, there is probably nothing commonly used in the home that has changed as little during the past century as the open flame gas lighting burner. Anything else that so closely resembles the style of 1816 looks old fashioned, indeed.

It is an extremely satisfactory article that meets with a steadily growing demand for a full century without having great improvements made in it. It is true that improvements have been made in gas lighting. They, however, have not been nearly as radical as those made in electric lighting. There are extremely few electric lamps in use to-day of the exact type used even thirty years ago. In the gas business we find burners of the same general type as those used a hundred years ago, in quite general use. There are gas companies doing a very considerable commercial lighting business that are still using lamps which they purchased ten or more years ago. It has never been necessary to scrap material in the gas business at the rate it has been necessary to do so in the electrical business.

The time, however, is approaching when more courage must be exercised in discarding old things and old methods and adopting new. In fact all improvements will have to be welcomed in the future with a great deal more enthusiasm than they have ever been welcomed before. During the past fifteen years great strides have been made in electric lighting. In 1906, the lamp in common use was a carbon incandescent lamp consuming about four watts per candle power. To-day we find lamps with an efficiency of one watt per candle power extensively advertised, and the lamp manufacturers promise lamps of even greater efficiency. In addition to the reduction in energy consumption of 75 per cent in electric lamps, most electric light companies have reduced their lighting rates at least 20 per cent during the past ten years. This gives a total reduction in the cost of electric lighting of 80 per cent.

Up to date, gas companies have been able to meet this competition with the same general type of lamp adopted some twenty-six years ago and which, though improved in form and distribution of light, has not been radically changed in principle. Now, however, in the face of these great and rapid reductions, in electric lighting, with the promise that the end is not in sight, it is apparent that the gas men, in order to hold the gas lighting business will have to become more courageous in the scrapping of old lighting equipment, and in adopting the very latest lighting systems and devices that have been discovered. It is no longer safe to place the main reliance on lighting systems that are fifteen, thirty or even a hundred years old. Present conditions demand the latest and the most efficient.

Benefits to Be Derived from Technical Writing

The simple setting down of one's thoughts on paper has great advantages over solitary pondering in impressing such thoughts on the mind and in establishing the relative value of the several ideas they involve. If any one doubts this statement, let him experiment by writing out his various movements during any day. He will find, here and there, something left out, an incident set down out of its proper order, or some event described in so vague a manner as to be scarcely comprehensible to the author himself. Even the keeping of a diary has its effect on the mental training of a man preparing himself to compete with other men in the battles of life.

Setting one's thoughts down on paper with the hope of having these thoughts recorded on a printed page has a vastly greater advantage. One writes in such a case for others to read. He expects criticism; to have the facts he sets forth disputed. Consequently, he writes with greater precision, marshals his facts with painstaking care, endeavors to anticipate and discourage contradiction by proving his contentions so clearly that there can be no disputing them, and revises his work with unsparing severity. In so doing, he has impressed his ideas so thoroughly on his own mind that they stand out in such bold relief that he sees them from angles never hitherto suspected. Their weak points are clearly revealed. Improvements instinctively spring to mind. Ideas are automatically matured into definite shape. He acquires the *habit* of thinking logically.

Particularly is this so with technical writing. Midnight study of the works of authorities undoubtedly will aid the young gas engineer on his progress upward. He will move faster, however, if he assists his mind to digest the knowledge he is endeavoring to absorb, by utilizing half the time he is devoting to slavishly reading the propoundings of others, to setting down on paper his conceptions of the facts they are seeking to explain.

Experience—the expression is trite, but true—is the best teacher. Yet how much value is experience to a man who forgets half of what he has seen or learned? Such is the case of most engineers—gas engineers and others. They take two years of practical work to gain the knowledge they could gain in one. Constant repetition is necessary to impress the practices they see about them sufficiently on their minds for them to become a latent knowledge. This is a waste of valuable time. By keeping a daily record—setting down in writing a description of each new method they see used—they could impress it so thoroughly on the mind that the repetition would not be necessary.

The young gas engineer, and the older one as well, if he has not already done so, should acquire the habit of writing down a description of what he sees and conceives. The training will be invaluable.

Special English Correspondence.

Monthly Letter from Norton H. Humphrys, Salisbury, England.

Legal Decision Respecting Public Lighting and the Defense of the Realm—A Gas Company Charged With Setting a Railway Embankment on Fire—Coal Supplies

One of the incidents connected with the war in which Great Britain is now engaged, is the nocturnal visits of aircraft and the indiscriminate dropping of incendiary and explosive bombs, most of which have fallen in residential centres that are neither fortified, or in any sense identified with military or naval operations. It was soon made evident that any coterie of lighted streets or thoroughfares might be selected for this form of attack. Therefore the necessity arose for practically the entire restriction of public lighting, especially in the eastern part of the country, and out of this has risen legal complications, as between the authorities supplying and those who order and pay for the public light.

Where the gas undertaking supplies gas only and the local authority finds the necessary columns, lanterns, burners, etc., keep the same in proper working order and repair and undertake the lighting and extinguishing, the solution is obvious.

Even under such circumstances, if the quantity of gas supplied to the public lamps is any important proportion of the total output, the gas company might raise the question that as a condition consequent to the adequate fulfillment of the contract, they had been compelled to provide special manufacturing, purifying, storing and distributing plant, which involved certain running expenses, even when the lighting was entirely stopped. But since the introduction of the incandescent burner, the usual plan is for the gas company to provide the whole equipment, including columns, lanterns and burners, to undertake all repairs and maintenance in addition to the lighting and extinguishing, and the supply of the necessary quantity of gas, for an inclusive charge per lamp.

Under these circumstances, the cessation of the lighting does not relieve them from the whole of the responsibilities that they have incurred under the conditions of the contract, but leaves them still liable for interest and depreciation on outlay and for maintenance and repair.

In the majority of cases, this complicated question has been amicably settled by mutual consent, but in others the opportunity afforded by labor candidates who are out to oppose gas companies and every form of vested interest, is too promising to be allowed to pass, and some local authorities are apparently unable to appreciate the real position as above indicated, and refuse to recognize these standing charges.

Their view is that they simply buy the light and that if that is stopped they lose the consideration purchased, and therefore can have nothing to pay.

The Leiston Gas Company is a small undertaking situated near the eastern coast, and in January, 1915, was carrying out the provisions of a lighting contract with the Leiston-cum-Sizewell Urban District Council, covering a period of five years, dating from Aug. 1, 1911, had provided 105 columns, lanterns, and inverted incandescent burners, and had accepted full responsibility for repairs, maintenance, lighting, and extinguishing, in addition to supplying the gas, in consideration of an inclusive charge per lamp per annum.

On Jan. 26, the whole of the lighting was stopped, under the provisions of the "Defence of the Realm" Act. The company endeavored to effect a compromise with the Council, in respect to the payments due under the terms of the contract on March 31, June 30, and Sept. 30, 1915, but was met by a blank refusal either to pay or to recognize any responsibility subsequent to Jan. 26.

The company then commenced legal proceedings for the recovery of the whole amount due under the contract, if the lighting had not been stopped, and secured judgment in its favor.

The Council carried the matter to the Supreme Court of Judicature-Court of Appeal, but was again unsuccessful. The decision of the lower Court was upheld unanimously by the bench, which comprised the Lord Chief Justice of England and two other justices. The case has been argued at great length, but really the difficulty is, that the state of affairs leading up to it was totally unanticipated and unprecedented.

Previous to 1915, no gas undertaking had been limited or interfered with by Government regulations relating to the lighting or otherwise of public lamps. The Lord Chief Justice held that when a party contracts to perform an act that is lawful at the time of making the contract, but subsequently becomes impossible of performance by reason of a change in the law, he is discharged from the responsibilities under that contract. So at present the law stands to the effect that a gas undertaking carrying out an existing contract at an inclusive charge, covering other services in addition to the supply of gas, is entitled to full payment of the same over the full period, or until the lawful determination of the contract, even if the Government will not allow a single lamp to be lighted.

A very usual clause in a public lighting contract, is a stipulation that it can be terminated at six or twelve months' notice, by either of the parties. The case is similar to that of a company which has engaged an employe and suddenly finds that on account of unexpected circumstances, it does not require his services.

Even if he does not do a stroke more of work, it is bound to pay him full salary for a term covered by the conditions of employment, or if no term of notice has been specified, according to established custom. The same position arises in connection with the tenancy of a house. The tenant is liable for rent up to the legal determination of his agreement, even if the premises are destroyed by fire.

A very peculiar and unprecedented dispute was recently under investigation at the Newcastle Assize Court. The North Eastern Railway Company claimed damages from the Blyth Gas Company, in respect to alleged trespass and negligence.

The "trespass" apparently consisted of repairs to a retaining boundary wall, the property of the Railway Company, running between the gas works and the embankment. On finding that the embankment was on fire, the railway officials made the remarkable discovery that the lower portions of it were composed of small coal, and the origin of the fire was claimed by them to be the heat from the furnace of a generator retort setting, which was built below ground level, which had penetrated through the intervening substrata, under the boundary wall, to the embankment.

The retort house was near to, but not in contact with the wall. The result was damage, by subsidence of the earthwork, and also to the abutment of a bridge. The embankment was constructed 80 years ago, and had not since been disturbed. It consisted of a base made up of small coal, above which there was a layer of sandy loam, next a mixture of coal and sand, and finally a top covering of ballast.

Some two years ago, the gas company extended the retort house and retort settings in the direction of the embankment, and in the course of the work, excavated close to the boundary wall.

Finding the foundations to be defective, it underpinned and repaired the same without giving notice to or consulting the railway company.

About a year later, a quantity of moisture and steam was observed to be escaping from the wall and the stone abutment of the bridge was quite hot. Subsequently fire broke out, and the embankment subsided. The exterior wall of the retort house, adjoining the boundary wall was also found to be so hot that a hand could not be allowed to remain in contact with it.

Although small coal had been extensively used for similar structures in the district, no record of a similar experience was obtainable. The plaintiffs removed the combustible material, extinguished the fire and filled in with sand. Evidence was submitted to the effect that the fire was not caused by extra pressure due to increased and heavier traffic, or by spontaneous combustion.

The gas company denied causing the fire, or any evidence of negligence, and claimed that before the liability for the damage could be fixed on it, it would be necessary to prove that the retort house had been erected too close to the boundary wall; also that it was aware, previous to the carrying out of the retort extension, of such an unusual circumstance as the presence of large quantities of coal in the base of the embankment.

The suggestion was made that the embankment wall was defective and out of plumb, and that of the foundations throughout the length underpinned, about 15 ft. were defective.

Other parts of the wall were ruinous and falling apart, and the foundations rested upon small coal and "duff."

The railway officials were satisfied so far as the quality of the repairs was concerned, but took exception to the trespass.

W. Doig Gibb, formerly engineer to the Newcastle Gas Company, and A. Clement Howey, consulting engineer to the defendant company, believed that the origin of the fire was undoubtedly spontaneous combustion.

The Judge thought it possible that spontaneous combustion was to some extent concerned, but that the fire was started by the heat from the retort house furnace. He did not find that the defendants were guilty of negligence, but they had caused a nuisance, and judgment was therefore in favor of the railway company, for damages to be agreed upon. Execution was stayed, subject to an appeal (if any) being lodged within 21 days.

One would like to offer some observations on this interesting case, but these must be held over pending a possible appeal.

The position of gas undertakings, in respect to laying in adequate stocks of coal to meet the requirements during the ensuing winter, is anything but satisfactory, as regarded from the point of view held by the purchasers, and the Government appears to be quite oblivious, as to the importance of maintaining the earning capabilities of the nation in every possible way.

In view of the enormous expenditure necessitated by the war, an opposite policy cannot but result in ruinous taxation.

Notwithstanding the assumed protection against extortion, supposed to be provided by the COAL PRICES (LIMITATION) ACT, many gas undertakings find themselves unable to place contracts over the next twelve months to the full extent of their requirements, on the terms therein indicated, for the reason that the collieries refuse to tender, in preference to accepting such terms.

Since the coal strike of 1912, the collieries have been opposed to the accumulation of stocks, by gas undertakings and other regular users, as when stocks are low and immediate supplies must be had, irrespective of cost, the slightest fluctuation in demand enables them to rig the market to their own advantage.

Complaints as to the paucity of replies to the usual advertisements soliciting tenders for the supply of coal over the ensuing twelve months, are very general and some parcels of tenders that I have seen are more on the lines of sporting offers than of normal business competition.

The Board of Trade has intimated that if any undertaking having cause to complain of the prices proposed to be charged for new contracts will bring the matter to its notice, it will be prepared to enforce the provisions of the Act.

Notwithstanding the wide-spread feeling that good grounds for such complaints are in existence, no one cares to bell the cat, for several reasons. It is difficult for an intending purchaser, from the information available, to prove an attempted evasion of the Coal Price Limitation Act. There would be delays or total cessation in the matter of present supplies, while the complaint was "having our best attention," and the position as to future supplies might be prejudiced.

The complainants would be to some extent "marked men," and as such, subjected to vexatious delays, if not to actual boycotting.

There is also an impression to the effect that the colliery interests are in the majority on Government Committees. There are already in existence, coal and coke committees, in the chief supply districts, working in connection with a central committee in London, for the purpose of controlling and regulating supplies, with a view of seeing that Government and other important requirements do not go short.

The efforts of these committees, which up to the present have been advisory and informal, have been strengthened by a regulation recently made under the Defence of the Realm Acts, authorizing the Admiralty, the Army Council, or the Minister of Munitions, after consultation with the Board of Trade, to give directions as to priority in regard to execution of orders, or of deliveries under the terms of existing contracts, for the supply of coal or coke, with a view to securing precedence, in accordance with their National importance.

It is already enacted that the necessity for complying with Government requirements is a good defence for actions raised in respect to non-fulfillment of the deliveries under existing contracts. But it is not easy for a Gas Undertaking to prove, to the satisfaction of a judge, that a reduction of say 25 per cent in deliveries, is necessitated or justified by special demands of this character.

Under the new regulations, gas works that are extracting benzol compounds from the gas will be in a position to solicit the assistance of the Minister of Munitions, in case of urgency, which is some consolation, seeing that they are not able to obtain anything like a fair proportion of the value of such compounds. Under present conditions of the tar market, they are obliged to accept a lower price for the tar *plus* benzol, than was formerly obtainable for ordinary crude tar.

First Members of New Orleans Public Utility Board Will Be Appointed August 15

The General Assembly of Louisiana has passed an act amending the act incorporating the city of New Orleans so as to provide for a board of public utilities for the city. The measure has been signed by the Governor. The board is to be composed of a city commissioner of public utilities and four other members who are qualified electors of the city. The members are to be appointed by the Governor. The term of office of the appointed members is to be four years, but the terms of the first members are to be for one, two, three and four years respectively. The men appointed to the board are to serve without salary unless otherwise provided by the Commission Council of the city. The terms of the members first appointed will date from Aug. 15, 1916.

The board is vested with authority to supervise and regulate the service rendered by all public utilities within the territorial limits of the city of New Orleans, and is authorized to fix reasonable and just rates of charges for the service and commodities supplied by the public utilities, to establish reasonable and just standards of service, to provide for accurate tests of the appliances for measuring the commodities supplied to the public, to prevent unjust discrimination and extortion in rates, charges, prices, fares, etc.

The act says that it shall be lawful for every public service utility to establish a sliding scale of rates, fares or charges, provided that its schedule showing such sale of rates, fares or charges shall have first been filed with the Commission Council and approved by it, and that it shall be lawful for every public service utility to establish with the consent of the council a scale of charges subject to automatic adjustment in relation to dividends to be paid to the stockholders or the profits to be realized by any single person engaged in a similar business. The Commission Council is empowered to delegate such of its powers and authorities to commissioners in the department of public utilities as may be necessary for the safe carrying out and execution of the purposes and provisions of the new act. The right of appeal to the court by any order of the Commission Council or the board is reserved to the utilities.

Toledo Railways & Light Company Burns 6,000,000 Cu. Ft. of Gas Daily Under Boilers

The Toledo Railways & Light Company, operated by Henry L. Doherty & Company, is burning 6,000,000 cu. ft. of gas daily under the boilers at the Water Street station. This is equivalent to a consumption of 140 tons of coal a day.

Progress in the Gas Industry Must Be in the Direction of the Performance of More Work for the Same Unit Value of Gas Used

Industry Must Attract to Its Service Young Men of Ability and Serious Purpose—Conservation is Aided by Competition—Constructive Work Must Be Done in Manufacture and Utilization—Field of Heat Element of Gas of Maximum Promise

The Gas Industry must so develop that it will continue to attract to its service young men of ability and serious purpose or it cannot hope to hold its place in line abreast of the times, asserts W. R. Addicks, in the August number of *Gas Institute News*.

The old idea of building a high brick wall about the manufacturing plant typifies in a way the viewpoint of the gas industry of the past. To-day we find nothing hidden or mysterious in the conduct of our business. National and state authorities would bare any secrets if they existed.

It was an old saw—"Competition is the life of trade"; while many doubt its soundness to-day yet as far as the gas business is concerned competition certainly improves the business prospects of the gas industry. The methods of the ablest competitor of the gas industry are being copied in some quarters by some gas managers.

Necessity of Applying Heat Element Scientifically

It is fortunate that the gas industry must hope for its greatest future prosperity through adopting means to conserve the latent energy in its product by continuing effort to apply the heat element scientifically, so that the required useful work shall be performed on two pounds of material when heretofore but one pound of material was treated with the expenditure of equal gas volume. In other words, the progress of the gas industry must be in the direction of the performance of more work for the same unit value of gas used. It may be noted that the ability to obtain uniform products through uniform and constant heat application is easy of attainment when using gas fuel.

Solid commercial fuel is increasing rather than decreasing in value, thus opening the way for gaseous fuel at ruling prices. This increase, however, is accompanied by a corresponding increase in the cost of raw products available for gas manufacture which must be overcome through the increase in the value of the residuals of gas manufacture, or the use of always lesser valuable products to reach the same end. Again conservation is aided by competition. Constructive work must be done in both directions, in gas manufacture and utilization as well.

Company Entitled to 10 Per Cent Return on Investment

The tendency of misguided governing bodies to take away from business a fair return for the public work performed must be modified if the best results are to be obtained for the public. The public would be better served if it were to-day an established principal, fully recognized heretofore, that a well managed concern was entitled to a 10 per cent return upon the investment in "plant and property" rather than the narrow view held by a few extremists that a bare confiscatory rate was all that the stockholders were entitled to.

Future of Lighting Increment

The writer has been fearful for the future of the lighting increment of the gas industry, but he is convinced that much of the loss of business in this direction is, aside from competition, due to three causes—first, to the inequalities in the product served, due to the candlepower standard of measurement demanded in our variable climate; second, to the absence of perfectly satisfactory mantle equipment for general service purposes, and, third, to an inadequate method of maintaining the mantle equipment at proper efficiency at satisfactory cost. The total abandonment of the candle-power standard is in sight, and is desirable, provided, however, it is recognized that it is essential that the heat unit standard shall be set at a point where a uniform gas product may be served under all atmospheric conditions.

The latest style of mantle equipment is superior to any yet devised and gives satisfaction in ordinary circumstances and it further gives promise of the early successful introduction of adequate mantle maintenance. Further, may we not hope for illumination through the application of the principles of surface combustion, where the fragile mantle would not be necessary in large space lighting. May not such illumination by gaseous "suns" become an established fact rather than a dream.

Competition in Power Branch of Industry

Competition in the power element of the gas industry is as great as in the lighting element. The gas industry, if it desires, can successfully compete in this field, if power units are intelligently introduced, where too large installations are not required and too great a load variation does not exist. The increased familiarity with the automobile engine should be an aid to gas engine use.

Field of Maximum Promise

But the field of the heat element of gas seems of maximum promise, and, while it is not as yet seriously threatened by our ambitious rival, yet the gas manager will be wise who encourages every method that promises economical use of gas, whether this economy is effected through the efficiency of the burners of the burning appliance itself, or through the use of the best type of appliances obtainable which recognibe the necessity for conservation of the heat to useful work after the heat is generated; and, further, by adopting still better and better appliances, as they become available, appliances that are *not* built, as heretofore, without thought of radiation losses, virtually upon the principal of the open fire for solid fuel where but a small percentage of the heat is effective, a large percentage being dissipated, not infrequently, up the chimney.

All of the above is quite independent of meeting competition through discount for quantity of gas used. Close attention to conservation of values both in manufacture and use is the line upon which the brilliant and resourceful minds of the gas business should bend their energies.

Similarly the gas industry will be greatly aided by concentration and comprehensive effort of all its members in one central association of national scope working consistently with associations of state or state group influence.

Gas Industry Not Represented on Naval Advisory Board

A committee on conservation of the value of the by-products of gas manufacture to the gas industry and the utilization and conservation of heat energy in gas would have a field that would tax all the energy of the best and most industrious minds and would be of untold assistance to the whole industry. Would it not be well for the Institute management to consider the appointment of such a committee to serve for three or five years.

The codification of rules for the installation of gas appliances will result in good to the industry, for attention is thus directed to the prevention of fire risks which thereby focuses attention on radiation losses which are the real source of such fire risks as may exist.

It is a humiliating fact that when the Navy Advisory Board members were chosen by the Secretary of the Navy that the gas industry was not represented, and this, in spite of the fact that no industry is more important to the government from a defence viewpoint. Its stores of coal, liquid fuel and by-product possibilities, the technical and administrative ability of its managers are all so manifestly evident that it is well nigh unbelievable that its advice was not sought here as in England.

Industry Entering Its Most Promising Era

The industry is about entering its most promising era, and its importance to the public welfare is a constantly increasing quantity.

The young man of education and ability, whether through technical school training or a graduate of practical experience combined with a steady technical absorption by profitable study inspired of unsatisfied thirst for knowledge in his business, will find both personal satisfaction and financial reward if he joins the army of workers in the gas industry which, however, offers no success or reward for the drone.

No branch of industrial business requires a wider knowledge of the arts and sciences than does gas manufacture when considered together with the proper utilization of its by-products as well as of its primary products.

At no time in the history of the gas industry is the promise so great. It is the promise of the rising, not the glory of the setting sun.

Items of Interest from Various Localities.

Asks for 60-Cent Rate for Natural Gas

A rate of 60 cents per thousand cubic feet is asked for by the Ashtabula Gas Company through its attorney, L. B. Denning, in a brief filed with the public utilities commission at Columbus, July 22.

The present rate is 36 cents. The city is appealing the proposed rate now, on the ground that it is exorbitant.

Mr. Denning, in a telegram to officials of the Ashtabula Gas Company, said to-day that the 60-cent rate is based on a 10 per cent return on the valuation of the company as fixed by the commission itself, adding a certain amount for depreciation, contingencies and betterments.

Aluminum Company Buys St. Lawrence Property

The St. Lawrence Gas, Electric & Transportation Company, of Ogdensburg, N. Y., recently sold out its property and franchises to the Aluminum Company of America. The Ogdensburg Power & Lighting Company, the Ogdensburg Gas Company and the Ogdensburg Street Railway Company were subsidiary companies of the St. Lawrence Gas, Electric & Transportation Company, the holding concern, and these corporations also have passed into the control of the new owners.

Terre Haute (Ind.) Secures 500,000 Cu. Ft. Per Month Industrial Fuel Consumer

Through the efforts of P. M. Spagnogle, industrial fuel expert for the United Gas & Electric Engineering Corporation of New York City, the Citizens Gas & Fuel Company, of Terre Haute (Ind.) has secured a new 500,000-cu.-ft.-per-month consumer.

The Terre Haute Malleable Iron Company has been operating six large coke-fired core ovens. There seemed to be but little prospect of converting this business to gas or of introducing any large economy with the ovens as they were.

Mr. Spagnogle, however, succeeded in greatly interesting the prospect in the advantages of gas fuel and finally secured permission to make certain minor changes in the construction of the ovens.

This done, the use of gas became distinctly advantageous and the change was made.

Results in operation proved so satisfactory that three additional core ovens, built especially for gas fuel at a cost of $2,000, were immediately ordered. In the meantime, a new consumption of 500,000 cu. ft. per month has been secured.

Boston Company Divides $57,047 Among Employees

The Boston Consolidated Gas Company has authorized the distribution to its profit-sharing employees of $57,047.93, reckoned according to the plan set in operation by the company in 1906. The number of profit sharers is 698, the average amount paid to each is $81.73, the shares of stock distributed 571, and the total amount apportioned since the profit-sharing plan was inaugurated $477,861.09.

This makes an investment in the stock of the Massachusetts Gas Companies on the part of employees who have been with the company since the beginning of the plan equivalent to about 85 per cent of the earnings of the employees, thus giving them a substantial owner's interest in the business.

The apportionment this year is on the basis of 8½ per cent of the employees' earnings, this being the same percentage as that paid upon the stock of the company during the past year. Under the sliding scale, the stockholders are entitled to 9 per cent with the price of gas at 80 cents, but the earnings of the year were not sufficient to justify the directors in paying the full dividend.

Sioux City, Iowa, Gas Company Wants Street Lighting Contract Revised

The Sioux City (Iowa) Gas & Electric Company has opend negotiations with the city on a new street lighting contract, covering a period of years. The proposed contract will take the place of one that now holds, and which has two more years to run, unless cancelled by the proposed new agreement.

Under the latter, the city will save upwards of $6,000 during the next two years, if the contract is accepted.

The company desires to manufacture heat unit gas.

Free Gas Heavy Burden to Key West Gas Company

Stating that the gas business in that city is a losing proposition, due to heavy taxes and the furnishing of 1,000,000 cu. ft. of gas free to the city every year, the Key West (Fla.) Gas Company has proposed that the gas for the city be furnished at cost, and that cheaper gas be furnished to consumers on a sliding scale. It also asks that its tax assessments be lowered.

Gas and Electric Companies Least Affected of All Industries During Business Depressions

Gas and electric companies are the least affected of all industries by general business depressions, according to H. M. Byllesby, president of the Northern States Power Company. There are, however, occasional acute local or sectional recessions, which unfavorably affect earnings. These acute dislocations do not occur throughout any considerable number of states at the same time.

Gas Replaces Electricity for Lighting Springfield, Ohio, Park

At a special meeting of the Park Board of Springfield, Ohio, held in that city, July 19, it was decided to proceed at once with the installation of a gas lighting system to replace the electric lighting system in the city's park. Because of the condition of the latter system it has not been used for some time, and, as a result, a part of the park has been in darkness.

Secure Many Good Prospects by Unique Method

A large number of good prospects were secured by a unique method at the recent seven-day cooking school held by the Everett (Wash.) Gas Company. Cards were presented to every visitor on which were printed various questions as to whether the signer used gas, as to whether a gas range, water heater or other appliance were connected, etc. Over a thousand of these cards were deposited in a box placed for the purpose, one of which was drawn, and to the signer of the winning card a gas range was awarded.

Accidents That Could Have Been Prevented

An employee failed to use goggles provided for him while cutting a 42-inch gas main. What was the result? A piece of steel entered his eye and the sight was destroyed.

A very serious accident caused by carelessness. The use of goggles was all that was necessary.

A meter reader stepped on a can while going down dark stairs in a consumer's house; was thrown to the bottom and sustained severe bruises.

Flash-lights should be used in dark places. Consumers cannot be depended on to keep obstacles off stairways.

An employee wore a pair of shoes with badly worn heels, which caused him to slip and fall while going down a flight of stairs. He suffered severe bruises of the leg.

Defective shoes may easily be a prolific source of accidents, and care should be exercised to keep shoes in good condition.

Safety News.

A Correction

On page 78 of last week's issue, in an article describing a confectioner's furnace, there appeared the statement that the cost for fuel per hour was ½ cent. This should have read ½ cent per pound of candy cooked. The consumption in one size of the furnace is 400 cu. ft. of gas per hour and in the other size 275 cu. ft.

Correspondence

The following letter has been received in regard to the publication, on page 28 of the issue of July 10, of a quotation from a local newspaper which praised a gas company for voluntarily lowering its rates. Though it would appear that it was not made plain to our correspondent that we were making such quotation entirely on account of the rather unusual fact of a daily newspaper looking beyond the obvious and seeing the real reason why rate reductions are possible, his letter is very welcome, and, we feel that it contains comment of such value as to justify us in giving it a place in our pages.

Sir:—On page 28 of your issue dated July 10, you print an interesting little story concerning the alleged voluntary reduction of rates for gas service offered by a company which I understand is located in this state.

This article would appear to indicate that an intelligent public press realizes that when a company, through efficiency in management and manufacture, makes a reduction possible in the price of gas, and follows this up with an offer to reduce the rates, the company is then entitled to the appreciation of the gas consuming public.

An article of that character must surely make the gas company feel good.

I am somewhat surprised, however, that a paper such as yours should publish announcements of this kind, when it apparently has every reason to know that the facts are not as mentioned by the report furnished to the magazine by the local newspaper.

In the first place, it ought not to have been news to you that there have been no rate reductions in the city to which you refer. The offer made by the gas company to reduce rates came after a complaint lodged with the State Public Utilities Commission had been under investigation for two years. The company, it is true, offered to reduce the rates after all of the testimony had been taken in the case, but the offer was rejected by the city council.

It may be news to you that the gas consumption of the company in question was lower in the year 1914 than it was in 1912, due, no doubt, to the effort of the company to induce consumers of gas for lighting purposes to discontinue the service and become connected to the electric circuit.

I enclose my card for the purpose of identification and to show my good faith, and will remain,

"Engineer."

Lighted Streets in the Fourth Century

The old Syrian city of Antioch appears to be entitled to the credit of being the pioneer of public lighting. It was founded about 300 B. C., and, in the fourth century of the Christian era, was a great city with about 400,000 inhabitants, most of whom were Christians.

Now it has less than a tenth of that population; its shattered city walls, ruined aqueduct, and other vestiges of its old greatness bear silent testimony to the blighting effects of centuries of Turkish rule.

It is concerning fourth-century Antioch that we have testimony that the streets and public spaces were lighted.

Libanius, who lived in the early years of that century, says of his native city: "The light of the sun is succeeded by other lights, which are far superior to the lamps lighted by the Egyptians on the festival of Minerva of Sais. The night with us differs from the day only in the appearance of the light; with regard to labor and employment, everything goes on well."

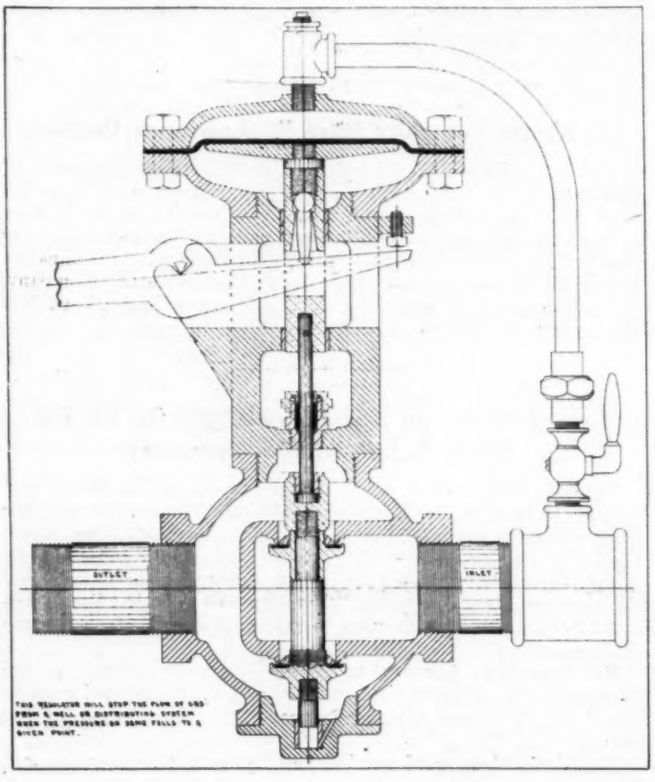
In another passage the same writer tells of some riotous soldiers who "cut with their swords the ropes from which were suspended the lamps that afforded light in the night time, to show that the ornaments of the city ought to give way to them."

Towards the end of the same century—probably in the year 378—there occurred in the streets of Antioch an altercation between an Orthodox Christian and an adherent of one of the sects.

St. Jerome records that these two enthusiasts disputed with each other "till the streets were lighted," when the listening crowd broke up; they then "spat in each other's face and retired."

Check Pressure Regulator Stops Flow of Gas in Pipes when Pressure Falls Below Certain Point

The purpose of the regulator illustrated herewith is to stop the flow of gas in a pipe line when the pressure falls to a given point. Sometimes it is desirable to stop the flow of gas in a line or system of gas lines, when the pressure has fallen to a lower point than is considered advisable. It is sometimes necessary to keep the pressure higher in one portion of a system of distributing



lines that are so connected that the gas flows from one to the other.

If it is desired to maintain, for example, a pressure of 10 lb. on one side of the regulator, it should be placed in the line with the inlet towards that side. The lever would carry sufficient weights to balance a pressure of that weight per square inch on the diaphragm of the regulator. So long as the pressure on the line leading from it remained above 10 lb., this pressure exerted on the diaphragm of regulator would cause the valve to stand wide open, and the gas would continue to flow through it. As soon as the pressure fell to 10 lb., the weighted lever would close the valve, and no more gas would pass until the pressure exceeded the desired amount. The pressure at which the regulator is desired to operate can be varied as may be desired.

The regulator is the product of the Chaplin-Fulton Manufacturing Company of Pittsburgh.

Conditions Governing Establishment of Research Fellowship in Gas Engineering at Illinois University

The following conditions governing the establishment of a research fellowship in gas engineering at the University of Illinois, for which funds were authorized at the annual meeting of the Illinois Gas Association held March 22, have been published. They read in part as follows:

The Illinois Gas Association as represented by its secretary-treasurer, will pay to the University of Illinois the sum of $500 for a period of four years to establish a research fellowship in gas engineering in the Engineering Experiment Station.

The officers of the various companies represented in the Illinois Gas Association will be requested to nominate for this fellowship one or more members of their staff who are graduates in engineering from some reputable technical school, who are likely to be interested in and to profit by an opportunity for advanced study and research.

The list of names thus secured will be transmitted by the secretary of the association to the director of the Engineering Experiment Station of the University of Illinois, who will, following the usual procedure of the university in the selection of Engineering Experiment Station research fellows, nominate, from among those who meet the university's requirement for admission to graduate standing, the candidate from the list who best meets the requirement and gives largest promise of success in research in gas engineering.

In the event that the officers of the Illinois Gas Association fail to nominate men for this fellowship, the university authorities shall be free to proceed to select a man as is customary in the case of other fellowships.

The research fellowship in gas engineering shall be in all respects similar to the regular research fellowships in the Engineering Experiment Station; that is, appointment to this fellowship shall be for a period of two years with a stipend of $500 a year, and one-half of the time of the holder of this fellowship shall be devoted to research work in some field of interest to gas engineers under the general direction of the Engineering Experiment Station, and the other half to graduate study leading to the degree of Master of Science.

Upon notification of an appointment to this fellowship, the officers of the Illinois Gas Association will make payment to the University of Illinois of the sum of $500 each year on or before the first day of September for a period of four ears, with the possibility that it may be renewed at the expiration of that time.

It is mutually understood that with very minor modifications the present course in chemical engineering offered by the University of Illinois may be adapted to the needs of undergraduate students desiring to enter the gas business. The university agrees to consider such additions to or modifications in its existing course in chemical engineering as may be desirable to further meet the requirements of gas engineers, and it will announce in its Annual Register the fact that students may by election secure courses which are desired to fit them to enter the field of gas engineering.

The results of the investigations that may be carried on by the research fellow in gas engineering shall be the property of the University of Illinois for dissemination to the public through such channels as it may select. Reports of work done shall be rendered the association.

Quarter-Turn Valve Eliminates Impulse to Open Window When Room is Over-Heated

In heating a building many tons of coal are burned to generate the heat that is wasted through the open window; for people will open the window when a room becomes too warm rather than go to the trouble of closing off the radiator, because the valve turns hard, often sticks, and requires many repeated turns of the wrist to close it.

This condition is eliminated by using the quarter-turn packless radiator valve shown in the accompanying illustration. A quarter turn of the handle in either direction opens or closes the valve. It is not necessary to stoop to turn the handle. A touch of the foot is all that is required. This feature makes it easier for a person to close off a radiator than to open a window.

The valve is of a distinct type, and is unique in its construction. It is made of steam metal of heavy pattern and finely finished. It is packless and all parts are interchangeable.

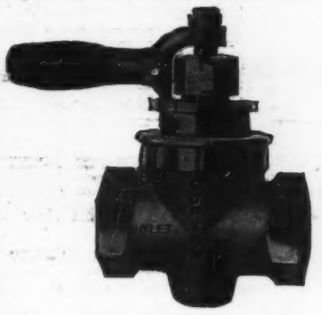
The inside of the valve body is cone shaped, accurately turned to received a cone-shaped disc, in which is a full size straightway opening. A quarter turn of the disc in either direction opens or closes the valve.

The disc is the important feature. It is made of a special mineral composition that, it is said, is not affected by high steam temperatures, nor by hot or cold water. It will not stick or corrode, and under ordinary conditions will last as long as the valve body itself. The disc is ground to exact gauge so that it will fit the valve body without lapping or grinding; it is therefore interchangeable.

The disc seats itself upon the inner surface of the valve body, and is held in place by a bronze spring, so that neither grit nor dirt can come in contact with the valve seat.

The disc and valve stem are connected by a loose joint which makes it impossible to throw the disc out of its seat.

The stem has a ball shoulder, which seats on the under side of the bonnet. It also has a groove, just above the bottom of the stuffing box, into which the special asbestos packing is forced. This ball shoulder seat and packing lock stem makes the valve absolutely packless and, it is claimed, eliminates all leaks.



The full size, straightway opening gives an unrestricted easy flow of steam, and a rapid return of the water from the radiator.

The valve is made in both the radiator and straightway patterns, for use on all systems of steam, vapor, vacuum and hot water heating. The valve, known as the Gorton Quarter-Turn Packless valve is manufactured by the Gorton-Lidgerwood Company, 96 Liberty Street, New York City.

New Lens Said to Afford Absolute Protection Against Ultra-Violet Rays

A large percentage of the energy radiated from all illuminants consists of waves of no value in the production of vision. Outside the limits of the visible spectrum lie the infra-red rays at one end, the ultra-violet at the other. It has recently been determined that not only does excessive infra-red energy tend to produce cataract, and ultra-violet energy to give rise to fluorescence in the eye—which interferes with distinct vision—but, also, if present in excess that they cause serious and permanent injury.

Obviously, therefore, the best glass for welding, etc., is the one which excludes most effectively the ultra-violet and the infra-red radiation. Moreover, since the sensation of glare is mainly due to violet and blue light, it is frequently of advantage to use a glass which cuts off the violet and blue rays.

A new lens has been developed by the Chicago Eye Shield Company, of Chicago, Ill., which, it is claimed, affords the eye absolute protection against ultra-violet, violet and blue rays, at the same time absorbing a large percentage of infra-red rays. It does not show any appreciable absorption in the rest of the spectrum and, on that account, permits a clearer vision, both near and far, than can be secured by the use of other lenses, such as deep green, smoke or blue.

Societies and Associations

The Refractories Manufacturers' Association.—At a meeting of the Refractories Manufacturers' Association, held in Pittsburgh, June 7 and 8, the following resolutions were unanimously adopted:

Whereas, the Gas Refractories Committee of The Refractories Manufacturers' Association, and the Refractories Materials Committee of the American Gas Institute, have made a report embodying substantially the progress of their work to the end of 1915, jointly undertaken by them in conjunction with Dr. A. V. Bleininger of the United States Bureau of Standards, as to their findings with reference to the requirements of the coal gas industry in respect to refractory materials, especially for coal carbonizing chambers, and

Whereas, the Gas Refractories Committee of this Association, after careful consideration of the coal gas industry's requirements in respect to refractory materials, especially for coal carbonizing chambers, as set forth in said report, recommends that the report in the form submitted be endorsed and accepted by The Refractories Manufacturers' Association, and

Whereas, the specifications embodied in the report differ substantially from the specifications already adopted by the Refractories Manufacturers' Association with respect to shape and dimension of the finished product, unusual care and attention in the selection and treatment of raw materials and in every detail of manufacture are essential to the fulfillment of these specifications, thereby materially increasing the cost of production, therefore, be it

Resolved, that this report in the form submitted and the specification as therein written, be and are hereby endorsed and accepted by the Refractories Manufacturers' Association, and be it further

Resolved, that the care required throughout the process of manufacture necessary to the production of refractories under these specifications, the resulting loss due to rejections, etc., be impressed upon those who may elect to use these specifications in their purchases of refractory material; and that they, therefore, may exercise the right to use their own best judgment in regard to requiring that their refractories be made under the specifications as written, and be it further

Resolved, that in view of the fact that general data in regard to properties of refractory materials is still limited, it would seem desirable to supplement the test specified in the present report by the study of supplementary methods of a simple character.

THE AMERICAN GAS INSTITUTE transportation committee announces that the Pennsylvania Railroad has been selected as the official route of travel to the annual convention, to be held in Chicago, Oct. 17 to 20, and that arrangements are being perfected for the operation of a special train on fast schedule. The route of this train will be via Philadelphia, Harrisburg and Pittsburgh, at which points delegates can board, and a car will be operated from Washington, stopping at Baltimore for the accommodation of delegates from that section and will be attached to the special train at Harrisburg. The special train will be made up of the highest type of all steel, electrically lighted Pullman equipment, consisting of parlor, smoking, drawing and compartment sleeping cars, observation car and Pennsylvania Railroad restaurant car, in which all meals will be served. Special entertainment features will be provided. Full details regarding the schedule, rates, etc., will be issued about Sept. 1.

THE EMPIRE STATE GAS AND ELECTRIC ASSOCIATION gas distribution committee has arranged for a meeting to be held Friday, Aug. 11, at 10 a. m. in the Employees' Club, East First Street, Oswego, at which the following subjects will be discussed:

Pressure.—Control and equalization in street mains with especial reference to good service and present statutory requirements.

Drips and Drip Pumping.—System of checking up on adequate pumping. Automobiles for drip pumping. Disposition of oil in yard and street.

Unaccounted-For Gas.—Contributing causes in high and low pressure system. Influence of condensation.

Street Leaks and Main Inspection.—Locating leaks in Winter—In Summer—Testing Mains—Patroling. Repair Work.

Personal Notes

ELMER BARRON has been appointed superintendent of the Station B plant of the Detroit (Mich.) City Gas Company.

NORMAN MCKEE has been appointed district agent of the Southern Counties Gas Company of California, at Santa Monica, Cal.

H. W. EASTERLY, formerly general manager of the Sheboygan (Wis.) Gas Light Company, has been appointed Russian representative for the Sterling Motor Truck Company. His headquarters will be at Petrograd.

JOHN I. MANGE has been elected vice-president of the J. G. White Management Corporation of New York City. Mr. Mange has been associated with the corporation since 1912, at which time he was elected vice-president of the Associated Gas & Electric Company, a holding company of electric and gas properties in New York, Kentucky, Ohio, and Tennessee, managed by the White Corporation. He was born in Pembroke, Maine, in 1876, and was graduated from Tufts College, in 1899, with the degree of Bachelor of Science. He has been connected at various times with the following companies: Charleston Consolidated Railway, Gas & Electric Company, at Charleston, S. C.; General Electric Company, at Schenectady, N. Y.; Lachine Rapids Hydraulic and Land Company, at Montreal; Oneonta, Cooperstown & Richfield Springs Railway Company, at Hartwick, N. Y.; Plattsburgh Light, Heat & Power Company, at Plattsburgh, N. Y., and Watertown Light, Heat & Power Company, at Watertown, N. Y.

SOLOMON LEWENBERG, of Boston, has been appointed a member of the Massachusetts Board of Gas & Electric Light Commissioners, succeeding Thomas P. Riley.

Construction Notes

CHICAGO, ILL.—Peoples Gas Light & Coke Co. has placed orders with the Illinois Free Employment Bureau for 200 men for trenching work.

ROCK ISLAND, ILL.—Press reports state that the citizens are planning to vote bonds in the sum of $48,000 to build gas and electric light plant.

BEVERLY, MASS.—Petitions have been presented for the extension of gas service on Essex Street at Montserrat and on Dodd Street at North Beverly. The gas company will make investigations to learn if there is enough demand to justify the installation of service.

FRAMINGHAM, MASS.—The Framingham Gas Fuel & Power Co. has applied for permission to open Bishop Street to lay a four-inch main beginning at the corner of Main Street and extending westerly a distance of 250 ft.

HOLYOKE, MASS.—The Municipal Light Department is completing the laying of a high pressure line.

LOWELL, MASS.—The Lowell Gas Light Co. is erecting a new storehouse.

PEWKSBURY, MASS.—Citizens are agitating for the extension of gas mains to the North Village.

WELLESLEY, MASS.—The Newton & Watertown Gas Light Co. is to make extensions.

LANSING, MICH.—The Lansing Fuel & Gas Company plans extensive improvements to plant, estimated cost $250,000.

GOLDFIELD, NEV.—J. B. Fayant has applied to the county commissioners for a gas franchise in this city. The application will be heard on August 9.

MORRISTOWN, N. J.—The Public Service Gas Co. is contemplating extensions.

BISMARK, N. D.—It is expected that work will shortly be started on the construction of the gas plant and distribution system to cost $100,000.

YOUNGSTOWN, OHIO—The Barrett Co. is erecting a new plant at Youngstown to take care of the tar output of the Sheet & Tube and Briar Hill Steel companies coke plants.

YOUNGSTOWN, OHIO—The East Ohio Gas Co. is to make extensions, according to reports.

Recent Patent Issues.

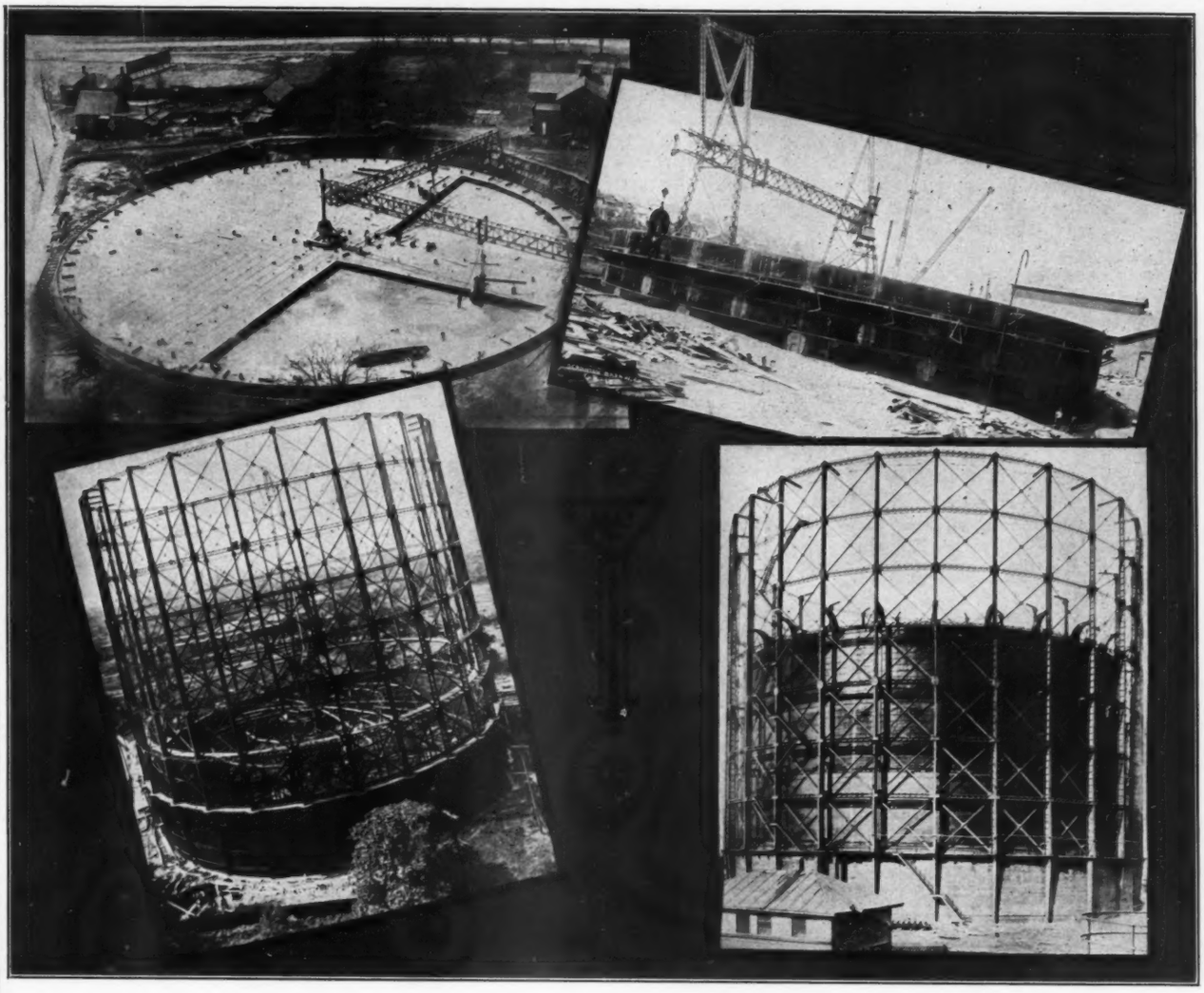
Prepared for the AMERICAN GAS LIGHT JOURNAL by ROYAL E. BURNHAM, solicitor of patents and counselor in patent causes, 833 Bond Building, Washington, D. C., from whom illustrations and specifications of any patent mentioned below may be obtained for 20 cents.

1,192,430. GAS-LAMP.—George Keith, London, England, assignor of one-half to James Keith, same place.

1,192,435. GAS-SAVING DEVICE.—Joseph J. Lampert, Seattle, Wash.

1,192,729. GAS-GENERATOR.—Dana D. Barnum, Worcester, Mass., assignor to Riter-Conley Mfg. Co., Pittsburgh, Pa.

1,192,782. INCANDESCENT MANTLE.—Abraham Herskovitz, Chicago, Ill., assignor to Peerless Light Co., same place.



RITER-CONLEY COMPANY

STEEL CONSTRUCTION

PITTSBURGH

HELME & McILHENNY

1339-1349 Cherry St., Philadelphia, Pa.

ESTAB. 1848 H & McI

GAS METERS

HINMAN DRUM STATION METERS, FOULIS GAS GOVERNORS
PREPAYMENT METERS

REPAIRING AND CONVERTING

PROMPT SHIPMENTS - - - - CORRESPONDENCE SOLICITED

Financial Notes.

PACIFIC LIGHTING CORPORATION.—Has declared extra dividend of ½ per cent on common stock in addition to regular quarterly disbursement of 2 per cent and regular quarterly dividend on preferred stock of 1¼ per cent all payable Aug. 15 to stock of record July 31. Impression is general that extra dividend will be paid every quarter from now on so long as earnings warrant, placing stock on 10 per cent basis.

BYLLESBY UTILITY PROPERTIES.—Combined earnings report of all Byllesby utility properties for the month of June show a gain of 13.6 per cent in net over the month of June, 1915. Net increase for the year ended June 30, was 11 per cent. Comparative figures follow:

Month of June	1916	1915	Increase
Gross Earnings	$1,261,285	$1,142,531	$118,754
Net Earnings	605,977	533,366	72,611
Year ended June 30			
Gross Earnings	16,295,551	15,016,963	1,278,588
Net Earnings	8,026,693	7,226,832	799,861

COMMONWEALTH POWER RAILWAY & LIGHT—Reports for June, gross earnings $1,322,295, increase 18.95 per cent; net earnings $658,601, increase 15.78 per cent; balance available for dividend $73,255, increase 41.24 per cent; for year ended June 30, gross earnings $15,841,539, increase 12.86 per cent; net earnings $8,277,298, increase 13.55 per cent; balance available for common dividends $1,577,172, increase 29.74 per cent. This is equivalent to 8.57 per cent earned on outstanding common stock of company.

AMERCAN POWER & LIGHT—Reports gross earnings for June from all subsidiary operating companies $635,844, increase $35,208; net earnings $293,589, increase $25,901; gross earnings for twelve months ended June 30, $8,076,257, increase $408,817; net earnings $3,737,614, increase $247,166.

ASHEVILLE POWER & LIGHT COMPANY—Reports gross earnings for June, $38,913, as against $35,023 in June, 1915; net earnings $18,034, as against $15,289; income after charges, $14,214, as against $11,089; gross earnings for twelve months ended June 30, $460,776, as against $445,359 for preceding twelve months; net earnings $208,910, as against $203,443, and net income after charges, $157,733, as against $151,291.

CAROLINA POWER & LIGHT COMPANY—Reports gross earnings for June, $61,081, as against $55,947 in June, 1915; net earnings $20,393, as against $18,588; net income after charges, $38,102, as against $19,132; for twelve months ended June 30, gross earnings $740,233, as against $652,941 for twelve months preceding; net earnings $280,697, as against $229,268, and net income after charges, $185,096, as against $116,137.

THE OHIO CITIES GAS COMPANY has declared a quarterly dividend of 2½ per cent on common, placing the issue on a 10 per cent per annum basis; also extra stock dividend of 5 per cent on common, payable December 1. This issue has been on an 8 per cent per annum basis.

MIDDLE WEST UTILITIES COMPANY—Has received authority to increase capital stock from $5,000,000 to $7,500,000 and has made arrangements to convert $1,500,000 debentures and notes into common stock at par.

DEPEW & LANCASTER LIGHT, POWER & CONDUIT COMPANY—Has been authorized by Public Service Commission to issue $75,000 of its 5 per cent first mortgage bonds at not less than 80, proceeds to be used toward payment of $90,000 in extensions and additions to be made in properties of company.

CONSOLIDATED GAS LIGHT & POWER COMPANY OF BALTIMORE reports the following earnings for year ended June 30:

	1916	Increase
Gross	$7,431,769	$642,367
Net	3,585,692	370,674
Surplus after charges	2,003,635	431,177
Dividends	1,131,803	67,175
Surplus	871,831	364,003
Surplus after depreciation, etc.	97,289	97,289

CONSOLIDATED GAS COMPANY OF NEW YORK has declared regular quarterly dividend of 1¾ per cent, payable Sept. 15 to holders of record Aug. 9.

AMERICAN LIGHT & TRACTION COMPANY.—U. S. Court of Appeals has held that Federal Courts have no jurisdiction in application of company's subsidiary, St. Joseph Gas Company, for order restraining Missouri Public Service Commission from enforcing ruling prohibiting St. Joseph Company from advancing rates on gas.

BLACKSTONE VALLEY GAS & ELECTRIC—Reports for June, gross $139,919, increase $17,916; net after taxes $62,116, increase $14,090; surplus after charges $41,817, increase $14,464; 12 months gross $1,659,853, increase $270,630; net after taxes $692,882, increase $138,140; surplus after charges $454,942, increase $130,228.

UNITED GAS IMPROVEMENT COMPANY OF PHILA.—Reports for first six months of 1916 increase in gross revenue of its subsidiaries outside of Philadelphia, of 8 per cent over first half of 1915, compared with increase in first half of 1915 over first half of 1914 of 1.4 per cent. In Philadelphia there was an increase of 7.55 per cent in gross revenues for first half of 1916 over first half of 1915, while later period showed decrease of 1.9 per cent in revenues from first six months of 1914.

UNITED PUBLIC UTILITIES COMPANY.—Has asked through Guaranty Trust Company for tenders to Aug. 8 for sufficient first lien 6 per cent collateral bonds to exhaust $76,137 now available for sinking fund.

Current Prices of Public Utility Securities

	Bid	Asked
Adirondack Elec. P	25	27
Adirondack Elec. P. pf	77	80
*American Gas & Electric	144	148
*American Gas & Electric pf	49	51
American Light & Traction	367	371
American Light & Traction pf	109½	111
American Power & Light	68	71
American Power & Light pf	84	86
American Public Utilities	43	47
American Public Utilities pf	74	77
Amer. Water W. & Elec	8	9
Amer. W. W. & E. part'g pf	17	20
Amer. W. W. & E. 1st pf	55	60
Carolina Pow. & Lt	26	30
Carolina Pow. & Lt. pf	96	100
Cities Service	292	297
Cities Service pf	85	86
Colorado Power	24	27
Colorado Power pf	99½	103
Commonwealth, Pr., Ry. & Lt	64	66
Commonwealth, Pr. Ry. & Lt. pf	84	86
Denver Gas & Electric gen. 5s	96¾	97¾
Electric Bond Deposit pf	85	87
Electric Bond & Share pf	99½	102
Empire District El. pf	88½	92½
Federal Light & Traction	11	13
Federal Light & Traction pf	45	49
Gas & Electric Securities	300	—
Gas & Electric Securities pf	96	99
Northern States Power	86	88
Northern States Power pf	95	98
Pacific Gas & Electric	58	59
Pacific Gas & Electric pf	87	90
Republic Ry. & Light Co	39	41
Republic Ry. & Light Co. pf	74	76
*Standard Gas & Electric	15	16
*Standard Gas & Electric pf	39	41
Tennessee Ry., Light & Power	9	12
Tennessee Ry., Light & Power pf	47	51
Toledo Trac., Light & Power	46	49
Toledo Trac., Light & Power pf	82	86
United Light & Railways	50	52
United Light & Railways 1st pf	74	76

*Par value $50